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From CES

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July/  
August  
1986

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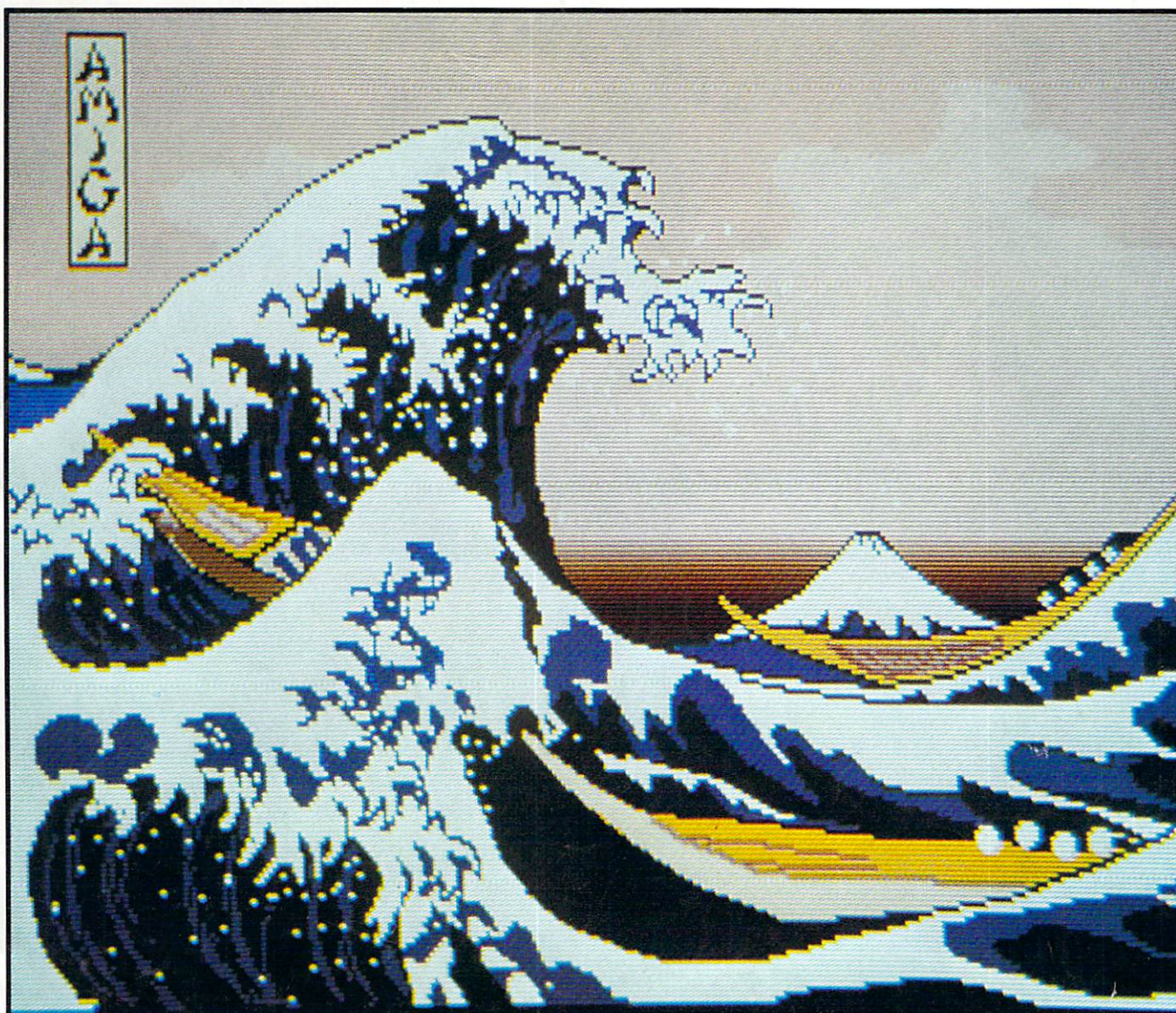
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Vol. No. 3

Issue No. 4  
P.D.C.

## THE *Guide* TO COMPUTER LIVING

*A Monthly Publication For Commodore™ Owners*  
(Formerly The Northwest Users Guide)



"The Wave" by Bob Woods

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**Getting the Picture – How Your CRT Display Works**







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by Bob Richardson

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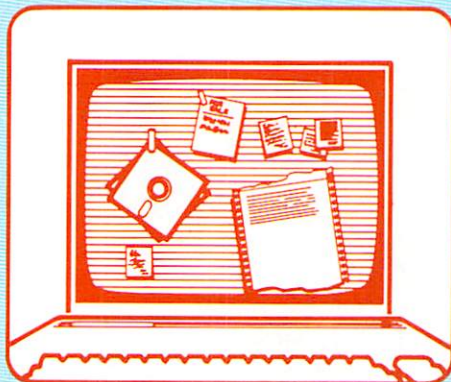
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The cover art, "The Wave", was created by Bob Woods with Electronic Arts' **Deluxe Paint** on the Amiga.

*The Guide* features high quality original artwork on the cover each month. All artists are encouraged to submit their computer artwork for consideration. The only restriction is that the art must have been created using a Commodore computer. This could be your chance to move that masterpiece from the screen on your monitor to the newsstands of America! And make a few dollars in the process.

Please submit all artwork on disk, with a cover letter describing the graphics package used to create it. It will be photographed from the screen, so screen dump capability is *not* a requirement.

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## Alter Ego

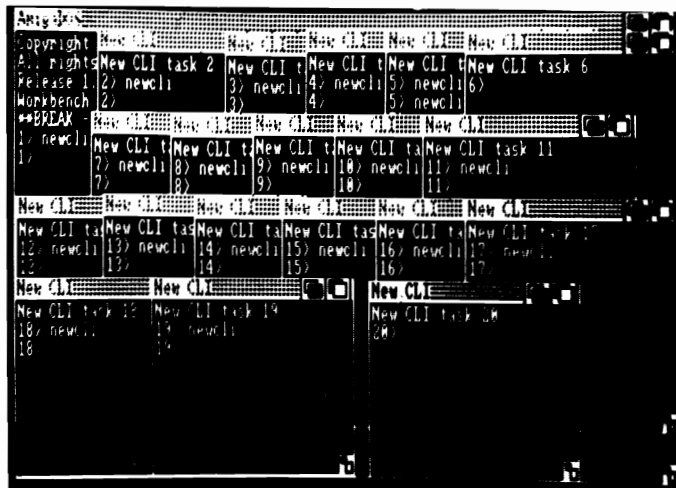
by Randy Chase

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by John Olsen

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## The Guide To Computer Living

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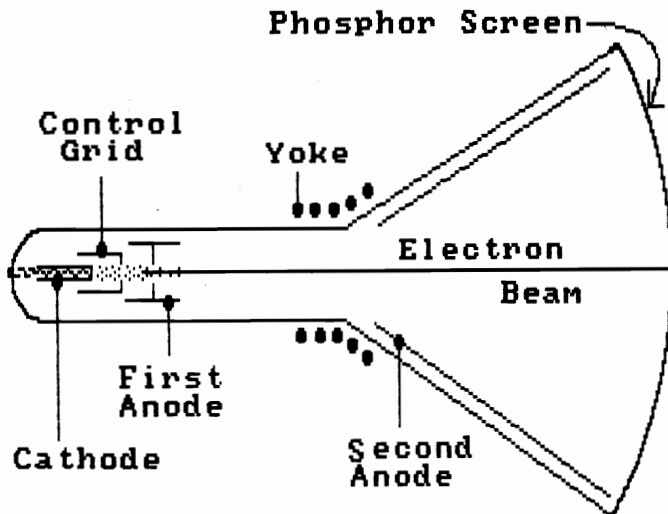
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You'll notice that the cover date of this issue of *The Guide* reads July/August. No, friends, we're not skipping an issue, but, due to our ever-broadening circulation, it has become necessary for us to make another dating adjustment — this time to accommodate our foreign distributors.

The next issue will roll off the presses one month after this one, but will bear a September date line. Once again, all existing subscriptions will automatically be extended one month to make up for the "missing" issue. Please accept our apologies for any confusion this may cause you, and our thanks for your patience as we continue to adjust to our rapid growth.

COMING  
NEXT MONTH

CONCLUSION ...  
THE TUBE



# Dateline Chicago:

## 800K Drive for the 64, & More!

by Randy Chase

Welcome, dear friends, to the streets of Chicago. The first day of the summer Consumer Electronics Show has ended and the circus in McCormick Center has closed for the evening. The White Sox are mired in sixth place, and the Cubs are already 13 games out of first place. Heraldo Rivera has left town, and Al Capone is *still* dead, I'm sorry to report. From their showing here at CES, someone surmised that Commodore isn't that far behind poor Al.

Our friends from West Chester are in the enviable position of having the most discussed computer in the show, and following a sense of logic that can make sense only to Commodore, they are acting as if the Amiga didn't exist.

If you want to see a demonstration of one, most software exhibitors will be more than willing to give you a preview of forthcoming Amiga titles; but you won't find an Amiga in the Commodore exhibit, and you won't find anyone there interested in talking about the machine that *should* be dominating this show. Instead, you'll find Commodore upstairs, tucked away in a hospitality suite, much similar to Atari's presence here last year.

This year it's Atari who's out on the floor with the largest, flashiest and busiest booth in the building. More on Atari later in this report. First, though, I'm sure you're waiting to hear about all those amazing new things that we so hopefully expected Commodore to unveil.

Commodore is in Chicago to introduce the exciting (?) new 64C, which is the replacement for the old faithful (and best-selling) 64. However, in a spell-binding example of news-speak, I listened to them explain that they hadn't discontinued the old 64, that it was sitting right there in front of me. It's just in a different piece of plastic, looking very similar in design to the 128; of course, it's without the numeric keypad and any of the other extra keys you'll find on the 128. It is also more expensive than the old 64.

The retail on this "new" computer — that they say isn't new at all, but is really just the same old 64 — is \$229.00. No one would make any projections as to what this new list price would translate to at the local dealer level (*i.e.* Toys 'R Us), but one can rest assured that it will mean that the consumer will pay more than they did in the past.

I've yet to find any documented evidence of anything

changed in the 64, other than, of course, the cosmetic redesign. The spec sheet doesn't hold any surprises, not even a mention of the supposedly improved power supply. The press releases provided make no mention of any hardware improvements within the system, but instead focus on the fact that they "redefined the family computer". According to Nigel Sheperd, GM of Commodore North America, "This is the computer solution for individuals and families who delayed purchasing a computer because they wondered about price, performance and ease-of-use."

The focal point of this redesign appears to be contained not in the newly-shaped piece of plastic, but in a couple of disks that Commodore will be including in the new 64C package. GEOS (Graphics Environment Operating System) is the new 64. GEOS is a very interesting piece of software and Berkeley Software is to be credited for this latest display of the true versatility of the 64, but I must admit that I find it hard to accept Commodore's assurances that the software industry is working to "design and adapt hundreds of new programs for GEOS".

In my *very* unofficial survey of software vendors at the show, I found no one other than Berkeley that was willing to admit to being



actively involved in development for this new disk-based operating system. Time will tell, of course, but I wouldn't sit around holding my breath. One has but to think back as recently as the much-heralded lap-held model for an example of CBM's failure to follow up on CES promises.

Those of us with existing 64's who wish to own this latest member of the Commodore family can do so by buying the Berkeley software for \$59.95. Provided, of course, that they are willing to make do without the new improved plastic case.

The other piece of bundled software contained in the new package is a Quantam Link disk. Of course, this is designed to make it easier for the user to subscribe and subsequently pay for this telecommunications service.

The most exciting and original aspect of Commodore's showing was ironically something they had little to do with. The people at LucasFilms have developed **Habitat**, an amazing on-line real-time multi-user graphics simulation that will allow users on Q-Link to control their own little computer person, and explore a disk-based world filled with mystery, adventure, and infinite possibilities.

For obvious reasons, they can't compare it to Activision's **Little Computer People**, but I can. While the concept is far from the "goldfish bowl" level of **Little Computer People**, I immediately felt that **Habitat** was filled with people who surely must be related to Arnold, who lives in my computer.

This game will be on-line this fall, with the capacity for hundreds of users to log on and take control of their little Avatar (their word for little computer peoples) and go exploring and interacting with other user-controlled Avatars. This is the most impressive and original development

in telecommunications gaming that I've seen.

Concurrent with the release of the new computer, of course, it's only appropriate for Commodore to offer a new disk drive; hence, the introduction of the 1541C. Again, it appears that the only thing new is that the old 1541 is now housed in a case designed to make it look like the 1571. The family is rounded out with the new 1802 monitor. And yes, you guessed it, there doesn't seem to be anything truly new about it, either (other than the slightly reshaped plastic).

When they introduced the 128 to the market, Commodore received much criticism for its "recycled" technology. I felt that while the 128 broke no new technological ground, it offered a unique combination of features that made it a viable addition to the marketplace. After looking at the "new" 64C, I have to wonder why they are bothering.

There is an old adage about not fixing something that isn't broken, and considering Commodore's precarious financial position, I have to question the logic in redesigning the best-selling computer in the world (and the source of the bread and butter that feeds Commodore's corporate cash flow problems).

I found the things that Commodore wasn't talking about or showing to be far more interesting (read that concerning) that their new 64's on display. Will there be a 3½ inch drive for the 64 and 128? "No," I was told quite emphatically. In fact, they say there has never even been any discussion of such a move. Will Commodore be releasing an "affordable" hard drive? Again, a very emphatic, "No." Again they say they've never even discussed that possibility. Curious how short and convenient their memories can be.

Also missing from Commodore's arsenal were the PC 10

and PC 20 which are reportedly selling quite well in both Canada and Europe. Apparently Commodore feels that it is a more lucrative move to redesign the 64 than to test the IBM clone market here in the states.

Another item on the missing-in-action list is the Unix system that they had on display here in Chicago last summer. The 128D, with the built-in disk drive that is being sold overseas, also doesn't appear to fit into their US marketing plans. But, friends, they will have lots and lots of new 64C's to sell you, albeit at a slightly higher price than they cost last week.

It's most disturbing that the Amiga seems to be temporarily forgotten. Apparently, they feel that this is a show geared toward the home user, and we all *know* that the Amiga is a "business" computer. It seems that they forgot to explain that to the software developers, because they are here foolishly displaying dozens of powerful and exciting new titles for this machine that Commodore doesn't want to talk about. These vendors also seem intent on continuing to develop *both* application and entertainment titles for the Amiga.

A variety of application tools for the Amiga are being previewed. Many are on display in the various exhibits, and even more are being previewed in hotel rooms around town. Precision Software unveiled a working version of **Superbase** for the Amiga which will at last offer the Amiga user a *real* database. Batteries Included showed a very impressive spreadsheet, and B.E.S.T. previewed their **Business Management System**.

With products like these forthcoming, the Amiga does indeed have very serious potential as a small business system, but for every piece of application software on display, there are at least five



or six new entertainment titles being announced. Both Access and Accolade were showing golf games for the Amiga, both of which were very impressive.

Firebird previewed an amazing new adventure game called **The Pawn** which, on the Amiga version, combines some of the most beautiful graphics at the show with a parser that seems to be capable of accepting a full paragraph of input as well as interpreting some very complex statements. One demonstration that caught my attention was its willingness to accept the command "Plant the plant in the pot", in which the word *plant* was used as both a noun and a verb.

Firebird has also released a very interesting new line of "flippy floppies" for the 64. This very aggressive British company seems quite intent on making serious inroads to the US market. With **Elite** resting on the top of the charts, they are now packaging a series of English best-sellers in 2-for-1 packs that will retail for \$19.95. Some of the titles were quite good, and some were not that impressive, but overall I would rate them as a very fair value for the money, and of a better quality level than most of the other budget lines now on the market.

As usual, the most sought-after invitations at the show were for Infocom's near-legendary gathering. Once again they rented the Museum of Natural History, and, this time, combined a very entertaining and competitive scavenger hunt among the mummies and llamas with the announcement of three new titles, two of which break new ground for the company that has almost single-handedly developed the genre of interactive fiction.

The most intriguing new title is **Leather Goddesses Phobos**, which journeys into an area that in the past has been untravelled by adventurers. If you haven't already guessed, were talking

about sex. Offering three playing levels, Suggested, Timid, and Lewd, this one promises to raise a few eyebrows, and quite likely entice some new gamers into Infocom's ever-growing customer base.

They also introduced the first in the "Plus" series of games requiring 128K of memory, with **Trinity**, a fantasy journey into the history of the atomic age. More details on this one next month, but, in a nutshell, it offers the player a chance to travel through time to every nuclear explosion in history (and even a few in the future). The third title announced was **Moonmist**, which is a gothic mystery set in a haunted mansion.

As time slips past, and my deadline rushes to meet me, I mustn't forget that I promised to talk about Atari. Yes, Uncle Jack is out there on the floor with a large flashy booth. My initial impression from the short time I've spent in it so far, is that it feels like a garage sale. Tramiel even has Atari video arcade games on display, along with what appeared to be just about every model of home computer they ever attempted to market. The 520 ST was there, but it seemed to be lost among the chaos of a very cluttered booth. To be honest, I didn't notice if the 1040 ST was there or not. I'll have to go back and explore more, now that I have this story behind me.

My apologies for the lack of comprehensive details in this report. I know that there is far more to tell you than I've touched on, but we'll be back next month with a much less hurried and greatly expanded report.

### **The Chicago report — news update**

Things are not always what they seem, especially when we are talking about Commodore. It's an on-going source of frustration to realize that if you ask a variety of CBM people the same question,

you'll often receive a wide variety of answers.

After a very interesting conversation with Commodore executive, Clive Smith, it appears that there is, indeed, a 3½ inch disk drive for the 64 and 128. I still don't have a release date or a retail price, but Clive did confirm that they are awaiting FCC approval for the 800K drive.

Smith also offered some clarification of the pricing structure for the "new" 64. It appears that on the distributor level, the price is being increased by only about \$20.00. The suggested list price is being raised to allow additional room for dealer profit, and may or may not have any significant impact on the actual selling price. If the price increase in reality translates to only \$20-\$30 for the consumer, I'll withdraw my complaints. A decent power supply is worth more than that, as everyone who has had to replace one will surely agree.

Since starting this report, I've seen several new products that warrant at least a mention. Activision will be releasing a sequel to **Hacker** that you won't want to miss. It more than lives up to the standards of its predecessor.

Electronic Arts' press reception provided the opportunity not only to view the pending releases, but also to meet many of the programmers and designers. The rumors you've heard are definitely true: **Marble Madness** on the Amiga is quite possibly the first home computer game to surpass the graphics of the original arcade version!

I had the pleasure of being introduced to **Mind Mirror** by its creator, Timothy Leary. Look for an interview and review in a future issue.

Again, there is far more news than time permits. Tune in again next month for details. Now, if only I can find my way to the airport ...

# Mother's Delicate Condition

by Robert J. Sodaro

A funny thing happened to me last Thursday night. I got a phone call from my imperious leader. You know him as Randy Chase. I call him Mr. Editor. As I arrived home around 10 or 11 PM EDT, the little red light on my answering machine was blipping. When I played back my messages, I discovered among them one from the aforementioned editor.

"So, Bob," he says to me, "will I be seeing you at CES?"

"Not unless you want to put up with me for a week," came my snappy reply. (Hey, I wanted to go, but was somewhat shy of capital to realize that possibility. Besides, I had become accustomed to the sedate lifestyle of being happily freelance. You know, waking up at noon, staying out all night ...).

"Sure, no problem," came his reasoned response, to which I most glibly responded, "Huh?" Seems I didn't read the fine print in my contract. (Hey, did I really sign a contract?) As part of my nebulous duties as a newly-instated consulting editor, it appears that I now actually *have* to listen to what Randy says. (As a freelance columnist, I was able (on occasion) to forget how to speak my mother tongue ... "Randy, I couldn't access PlayNET, so my column is in the mail," wink wink, nudge nudge.)

No more. Once they put your name on the masthead it means that you're responsible. Responsible for what, I'm not sure. But you are, Indeed, responsible. So here I am in Chi-town trying to hack out ... er ... earn a living. (I'll refrain from telling you how tough it is to book a flight (change it twice) and arrange your life to skip town in seven days or less. Suffice it to say that I don't advise

it — no one quite understands what is going on, yourself included.

So here I am. CES. The big time. However, this isn't quite what I remember. I've been here before, you see. Back when I was managing editor for *Ahoy!* I was out here, but that was exactly two years ago, and business was booming then. We were hearing predictions of a computer in every home and a modem for every phone. All the giants were here — Commodore, Atari, Mattel, Coleco, Texas Instruments, and they were joined in force by an army of software houses: Electronic Arts, Mindscape, Activision, Broderbund, Synapse, and all the rest.

The show itself was so big that it filled three convention halls. (Think of the coliseum where you last saw a rock concert, car, or boat show, then triple it. That was the size of *one* of the convention halls ... no, I'm not kidding. This show was so big that if you spent just 30 minutes at every booth you would be sporting a full beard by the time you were done.) CES is split into three buildings — audio equipment in one, computers in another, and everything else in the third. Even so, Atari was found in the main building with an enormous booth all their own. (Their booth was easily twice the size of the apartment I lived in at the time.) Today,

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the computer section was not that big.

The building I remember as being for computers is not only shared with the video people (on the main floor, yet, requiring this reporter to trudge between the first and third floors all day long) but adding insult to injury, the software floor was split *again*, the shared space being occupied by the adult videos.

Has the steam run out of our computer revolution?

We've all heard about Commodore's cash flow problem and seen dozens of hard and software manufacturers drop out of the public eye. Even the lumbering dinosaur, Atari, the godfather of the industry, seems to be running close to the edge. (Their booth was the largest here, but not so huge as it has been in past years, and most of their products on display were old 2600 and 5800 classics, simply dredged up, dusted off, and mounted on the walls.)

Oh, yes, our beloved Commodore was there too. But their booth was tucked away in a corner, and they were only showing a couple of products. Sure, one of them was the "new improved" 64 (last year's model with a new skin job to make it look more akin to a 128) and a video tape of their new LucasFilm game to be played on Q-Link (multiple player, sounds great). Of course there was also GEOS and some 128 stuff. But where was the Amiga? And, what ever happened to the LCD?! I would have paid real money for that little jobber.

Seems to me that when you want people to believe in you and/or your product, you put it out on display and talk it up. This bait and switch tactic smacks of the popular image of a used car salesman. Wake up and smell the disk drives, fellas. Uncle Jack is long gone. Works for the competition, he does. The Magna Carta has been established and the Bill of Rights written. We're supposed

to have an "open door" policy and actually cooperate with the press.

Something that Commodore never seems to understand is that in spite of what may appear to be contention between them and us (the press community) we're all on the same side. I think it a safe bet that not one reporter, editor or publisher in the Commodore community holds any ill will towards the big C.

"Not so," you claim? Well, let me put all these "harsh" comments about Mother Commodore in perspective. If they went out of business, the staff of *Ahoy!*, *Compupe's Gazette*, *Run*, *Info* and, yes, even *The Guide* (to name a few) would all be out on the street. You see, we sort of make our living off this company. If we rag on those guys it's only because we want them to continue on into perpetuity, not to slip beneath the waves of obscurity (anyone out there interested in punching out their meal ticket? I thought not. Me neither.) It is unfair to expect us (the press) and the consumers to get all our news fully from Commodore Pravda.

Come clean with us, guys. We won't bite. Really we won't (and if we do, it will only be a friendly nip, just to keep you honest).

Just so you don't think I'm grousing only against Mother C, where the heck were Mindscape and Electronic Arts? Yeah, yeah, I know that they're here somewhere, sequestered away in their hotel suites with private showings of their new stuff, but why not here on the floor with everyone else? Activision had a private suite, but they're on the floor as well. To my mind, when someone doesn't show up, it looks a little fishy, and gets them talked about (like I'm doing now). I've liked nearly everything published by both these firms, but why they're not out on the floor of the show mystifies me. Much smaller houses are, so why not them?

I can throw into this a personal annoyance: when I, as a reporter, make an appointment to see them in their hotel suite, I have to leave the show, find a cab, travel across town (pay for the cab) meet with them, then hail another cab to get back to the show (and, again, pay for the cab). I don't so much begrudge the money or the time spent, since I would spend this time on them anyway, and I probably get more hands on time with the products this way. But I blow an hour or so travelling.

While you may perceive all these things as minor annoyances, they can make or break a show. They can also reveal a deeper trend that is occurring in the industry. With fewer and fewer manufacturers showing up at CES (the big show), what does this mean for the home computer industry? Now don't get me wrong. I'm not one of those doom-and-gloomers. I think the industry is as healthy as it can be, and one day we just may have a computer in every home and a modem on every phone.

Look, if Atari can virtually create this industry overnight, drop to the bottom of the heap, and come back with a product like the ST (which has everyone talking and developing products) then anything is possible. Even the prospect of Commodore coming clean and talking to us like we were adults and really showing us some of those revolutionary new products about which we've heard so much.

Yeah, I 'm a Commodore fan, and I really did enjoy CES (thanks for the invite, Randy) but I do see some room for improvement ... for all of us. Because I, for one, do not wish, fifty years hence, to see Heraldo Rivera standing before the sub-basement in West Chester saying to a camera, "Yes, it's here, the long lost LCD ..."

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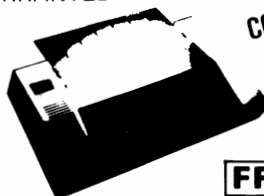
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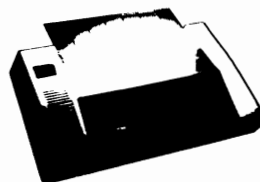
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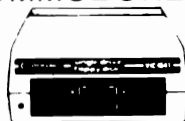
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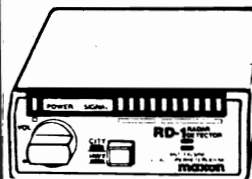
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# RND (0) Notes:

## CBM Cuts Staff, Introduces New 64

by Randy Chase

Well, with my departure for the summer Consumer Electronics Show in Chicago two days away, the Commodore world is full of speculation and anticipation about what new announcements our friends in West Chester have up their corporate sleeves. As usual, there are far more contradicting rumors (and more confusion) than facts to talk about. Perhaps it's the unpredictability of Commodore that makes them such a fascinating company to observe.

Even as I write this, there is *still* confusion as to whether or not Commodore will be exhibiting in Chicago. Although they were the talk of the Comdex show last month in Atlanta, they seem to have had a hard time making up their corporate mind about participating in the summer showcase in Chicago. This afternoon I was assured that they would be there, albeit only in a small booth on the mezzanine; but, earlier in the day two major software firms who had expected to participate in Commodore's exhibit at the show were telling me that as of today, they were told that Commodore would definitely *not* be there. I'm going back expecting to see them, and expecting some clarification of the various rumors about the "new" Commodore 64.

One of the frustrations of the publishing and circulation cycle is being placed in a situation where one has to write about things before they happen, knowing as you write that the reader already knows what *really* happened. Such soothsaying can lead to ulcers, alcohol, and early extinction. We managed to adjust deadlines by a

few days in order to bring you a live-from-the-show report on C.E.S. Elsewhere in this issue, you'll find on-the-scene reports from both Bob Sodaro and myself, phoned into the office only hours before the presses roll on this issue.

Considering that, I'll ask in advance your forgiveness for anything in this column I'm writing now that proves to be contradicted once I arrive in Chicago and do a reality check with our friends at Commodore. But, in spite of the hazards, I'll pass along what seems most probable among the rampant rumors.

### The "New" 64?

Yes, Virginia, it's true that the best-selling computer in the infantile history of this industry is about to become a thing of the past. The dear old beige brute is about to be retired. In its place Commodore is releasing a repackaged 64, contained in a piece of plastic more directly related to the 128.

Now don't get too excited — there isn't a numeric keypad, or any of the new function keys featured on the 128. It's the same old set of keys, and the same old set of chips, but now it's shaped more the like newer and sleeker 128. Let's face it, while the 128 may look more like a computer, if they're going to change anything, wouldn't it have made more sense to offer some new features?

I guess the best news is that the new 64 will include an improved power supply. While this is a radical improvement, at the same time I just can't consider it a major technological breakthrough.

Considering how many computers have been fried by faulty power supplies (and how much money has been spent by users replacing equipment damaged by a power supply that *everyone* knows is inadequate in design and capacity), I feel this is something that Commodore has owed to their customers for years!

Rather than congratulating them for this "remarkable" improvement, I'd like to ask why the hell this wasn't done a couple of years ago when it became apparent that the old power supply was a joke? The power supply problem has been evident even to Commodore for a long time. A year ago, while talking about the new power supply for the 128, one of Commodore's engineers joked that "at least this one won't burn down any houses!"

The other major difference between the "old" and the "new" will apparently be the inclusion of a couple of disks in the box with the new-look 64. Quantum Link software will be included with the computer, as it currently is with their modems. Again, while it's a nice touch, it isn't exactly earth-shattering; especially considering that the hope is you'll like the system and become a paying customer.

The major part of this "new" 64, and the feature that Commodore is banking on breathing new life into the 64 market is **GEOS** from Berkeley Software. This Macintosh-like operating system will supposedly be included in the new 64 package. Of course, both Commodore and Berkeley have offered the customary "no comment" when questioned about

the plans. Commodore representatives have been quoted elsewhere, however, as saying that this revolutionary new operating system will greatly enhance the power of the 64.

I don't want to sound like the Grinch trying to steal Christmas, but I have to admit that I'm just not all that impressed. We will be reviewing **GEOS** in the near future, and I'll admit it's a very entertaining piece of software, especially if you have Mac-friends you want to impress with your toy store computer; but I don't see how anyone can consider an operating system that will run a grand total of *two* pieces of software revolutionary. I wouldn't for a moment consider trading my copy of **PaperClip** for the word processor that runs with **GEOS**, and I wouldn't trade either **Doodle** or **Flexidraw** for the drawing program.

Maybe I'm spoiled, having spent my entire computer life with my delightfully colorful Commodore, but my first reaction when shown **GEOS** at C.E.S. in Las Vegas was, "Why would I want to turn my colorful 64 into a dull grey and black Mac?" To be fair, let me say that I think that **GEOS** is a very remarkable piece of software, and is another good example of just how powerful and versatile the 64 can be. **GEOS**, as a piece of innovative software, I like; but **GEOS** as the operating system of the future for the 64 I have serious doubts about.

The price for the "new" 64 will supposedly be \$199; but as with all Commodore rumors, we'll just have to wait and see. Early rumors were predicting a price well over \$200 which would be disastrous. Commodore must find a way to find a price niche for both the 64 and the 128, and anything that raises the price of the 64 closer to that of the 128 is *not* going to help either machine.

The piece of news that most fascinates me is the rumor that

Commodore will be releasing 3½ inch drives for the 64 and the 128. Now *that* is something that I see as having some real value. The biggest flaw in the 64 has always been the slow speed and erratic nature of the 1541. The prospect of adding the speed and capacity of a 3½ inch drive will do far more for sales than the new plastic case or the **GEOS** disk.

There is also speculation that Commodore will be releasing an affordable hard drive for these machines; but then we've been hearing that rumor for so long that it's hard to be very excited about it. In all probability, it'll be just another elusive tease. Remember, these are the same people who let us drool over the prospect of owning that remarkable little lap-held model, only to finally admit that they had no intention of actually releasing it.

### **Musical Chairs, Fading Faces**

Sometimes it almost seems that the "Commodore is dying" rumors are fueled by Commodore themselves. Just when it appears that perhaps they aren't doing as badly as the industry press portrays, they turn around and announce that they are beginning a series of lay-offs designed to reduce their staff by half. The most unsettling aspect of this latest wave of cut-backs is that it appears the majority of the west coast based Amiga team is being dismantled. The West Chester operation has a well deserved reputation for its inability to provide any semblance of customer support, and it's frightening to think about Commodore-Amiga suddenly becoming just "Commodore".

If they can't provide support, for both users and developers, for the 64 and the 128, how can they even attempt to support the much more complex Amiga. Such a lack of support at this critical stage of software development and public

acceptance could be fatal. Come on guys. I've said all along that the Amiga would succeed in spite of Commodore, not because of it; but let's not see how much you can do to undermine the very machine that is supposed to be the salvation of the company.

We'll just have to wait and see what impact these staff reductions have on Commodore's overall operation. From past history, I don't know if they can seriously do much damage to customer support; after all, how can you hurt something that never existed?

---

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Last month, while we are talking about the Commodore support system, I complained about the lack of activity from CP/M developers to support the 128. No sooner did the issue hit the newsstands than I heard from companies actively publishing CP/M titles, and those conversations offered a glimpse of the other side of the coin.

One company reported that in a year of trying to make contact with Commodore regarding technical support in converting programs to the 128, they had yet to find anyone at Commodore willing to talk to them. After hearing several stories, all quite similar, I have to wonder if I wasn't a bit hasty in pointing the finger at the software developers. Perhaps if Commodore were more accessible to developers, those companies developing software would be more active in pursuing the Commodore market.



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## Amiga Software News

Lest I start sounding like an Atari advertising campaign, let's switch gears and talk about what's right with the world instead of all the things that need improving. As Lyn explains in her column, I've got a new girlfriend I'm spending most of my time with these days. She sits at a right angle to my 128, with a direct tie into my stereo, and is the most amazing and dazzling electronic wonder I've encountered since the first time I got to flip the on/off switch on a radio transmitter. Yes, I finally broke down (motivated by both impatience and the discounted pricing) and brought an Amiga home.

I'll leave all discussion of the internal wonders of the Amiga to Grant, and others more technically inclined. Keep in mind that I've never claimed to have any comprehension of the mystical workings of the electronic world. Even though I worked in radio for several years, I still consider it nothing short of magic to flip the power switch on and hear music come out of the speakers. And even though I spend the majority of my time writing about my computers, I still am amazed everytime I sit down and touch the keys only to watch the monitor screen take me off to wonderland once again.

Instead of trying to explain the intricacies of CLI, or marveling at the collection of chips that make it all work (Grant now tells me that there is even an 8-bit processor contained *in* the keyboard) I'll instead share some observations of the software I've explored in the first month of my heated affair with my new mistress. There is really a lot more software available for the Amiga than one would think, listening to the critics. While there are still some very conspicuous voids (especially a really powerful word processor or any kind of data base!) there is, in all reality, far more software already on the market than I've had a chance to examine. I have

played with a variety of things, however, and will share some quick impressions on what I've seen.

The lack of a good data base (or, for that matter, even just an adequate one that you could walk into a store and take home) is the biggest single void on the Amiga shelves. Word processors are finally starting to appear, although I still haven't seen anything that can compete with the features of my old reliable **PaperClip**. **TextGraft** would almost be funny, were it not the only word processor available at the time I picked up my Amiga. Somehow, I was left with the distinct impression that this package was possibly a first cousin to the comical **Magic Desk** that marked the first release in a series of 64 software that Commodore wisely decided to discontinue.

I ended up opting for using the **Note Pad** contained in the Amiga as an alternative. Now I hear that the forth-coming **TextGraft Plus** may show some promise; but in its initial form, **TextGraft** is using the descriptive phrase *word processing* very loosely. The most promising word processor I've seen so far is **Scribble**, but while it is adequate, it only foreshadows what is possible on this machine.

The graphic abilities of the Amiga are almost beyond description. If you are one of the few Commodore owners out there who haven't yet experienced the impact of seeing a demonstration of the graphical prowess of this machine, you owe it to yourself to go out this weekend and indulge in a fascinating display of science fiction becoming commonplace reality. It's only fair that the graphics area was one of the first to be well-supported with sophisticated software. In fairness, considering the graphics abilities of the operating system, it was the easiest to explore and exploit in the earliest days of software development.

Both Aegis' **Images** and Electronic Arts' **Deluxe Paint** are very sophisticated graphics packages that are surprisingly easy to use. I personally prefer **Images** because of the extra features it contains (and, to be honest, possibly because I've spent more time with it). From my initial explorations of **Deluxe Paint**, I suspect that perhaps for the casual artist just wanting to play that it may be easier to master. It's just not as complicated as **Images**, primarily because there are fewer choices to wander through. Last month's cover, "The Golden Gate", was done with Aegis, and "The Wave" this month was created with **Deluxe Paint**. As you can see, both are probably capable of far more art than most of us normal computoids are ready to use.

An apology is in order. When reading the lists of software titles available in these early days of the Amiga, I skipped past the lists of Infocom titles. After all, I've already got most of them for my 64, and what's the big deal about text adventures for the Amiga. Right? *Wrong!*

The other night, at a friend's house, I suddenly discovered that there is a radical difference between playing **Wishbringer** on the 64 and on the Amiga. Stop for a minute and think about the last adventure game you played. What one thing did you do during the course of the game more than anything else? Wait for the disk drive to load the next descriptive block of text, right? All of a sudden, playing an Infocom game is no longer directly related to playing chess by mail. The entire game is resident in memory and when you enter a command and hit the return key, the screen is instantly filled with the next scene.

While the graphic adventures will still go back to the disk drive, the time involved is so radically different that even an impatient type such as I can enjoy a graphic adventure like Activision's **Bor-**

**rowed Time**. (Now, if only I had the patience to figure things out instead of looking at the cheat sheet!)

We've yet to see a really good music package, although there are several demo versions floating around of Commodore's **Musicraft** that look quite promising. Activision's **Music Studio** is now available, but it does little more than tease the potential of the Amiga. Most glaring among features that were omitted in the rush to be the first music program on the shelves is the ability to easily mix and match instruments. The latest word from Electronic Arts is that **Deluxe Music** won't be out until fall, and as usual, no one at Commodore is willing to talk about a release date for **ConcertCraft**.

The most ironic software package available for the Amiga has to be **Golden Oldies** from Electronic Arts. A few nights ago, I found myself laughing at the irony of letting the morning sun sneak up and catch me playing a very realistic re-creation of **Pong** on my state-of-the-art wonder machine. There is surely something poetic in the situation. Perhaps next time I talk to **Racter** I'll have to mention it; he is, after all, very adept at expounding on artistic and poetic gibberish.

## In Closing And On Boarding

Well, there is a plane to catch at PDX and a circus of electronic wonders awaiting in Chicago, so I must follow the tantalizing draw of the beginning of summer. Elsewhere in this issue, Bob Sodaro and I will give you an on-the-scene report from McCormick West. Perhaps, with a bit of luck, we'll even run into our friends from West Chester and be able to share the official rumors instead of these entertaining grapevine forecasts.

## COMPARE

x = included  
- = not included

C64 COMAL 2.0  
C64 COMAL 0.14  
C64 BASIC 2.0

```

==SPRITES==
x x - Keywords for defining sprites
x x - Keywords for setting sprite color
x x - Keyword for moving sprites
x x - Built in collision detection
x - - STAMP sprite image onto screen
x - - Animate sprites, interrupt driven
x - - Attach sprite shapes to programs
==GRAPHICS==
x x - Turtle graphics and X/Y graphics
x x - Hi-res or multicolor graphics
x x - Split screen (text/graphics)
x x - Background/border color keywords
x x - Mix text and graphics on screen
x - - Graphics text in any size
x - - Graphics text sideways
x - - Save a graphics screen to disk
x - - Window capabilities
x x - Line clipping within frame
x - - ARC and CIRCLE commands
x x - FILL command
x x - PLOT a point
==SOUND==
x - - BELL command
x - - Built in sound commands
x - - Control sound envelope
x - - Interrupt driven music built in
==MACHINE LANGUAGE==
x x x Call machine code routines
x - - Call machine code by name
x - - Link machine code to programs
x - - M/L routines parameter passing
==OTHER==
x - - Modem communications built in
x x - Function keys defined
x - - Function keys alterable by user
x x - Stop key disable / enable
x - - Cursor command
x x - No "garbage collection"
x - - Joystick/paddle/lightpen keywords
x x - Built in string search - IN
x - - Store a text screen for later use
x x - Long variable names

```

Compare. Even more comparisons are on the opposite page! Check the reviews. COMAL got a straight A rating from the Book of Commodore Software 1985, got the highest 5 star rating from Info Magazine, and got the highest rating of 10 from the Best Vic/ C64 Software review book. Send us a SASE - we'll send you a 24 page COMAL Info booklet.

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# FontMaster II — The Word Processor With Something Extra

by Mindy Skelton

Oh, I can hear you out there. “Oh no! Not *another* word processor review!” Well, as a matter of fact this *is* another word processor review, but believe me, this is *not* just another word processor. **FontMaster II**, by Xetec, is one of the most innovative, friendly and entertaining programs I have used in ages. I hardly know where to begin in singing its praises.

Well, strictly speaking, that's not, the truth. I know *exactly* where to begin. **FontMaster II** has the capability of printing your document in one or several of 30 ready-made fonts, ranging from typewriter to mirror image to two kinds of italic, two kinds of script, block, bold, Celtic and even Greek, Hebrew and Russian alphabets. Easy-to-access commands make it possible to change fonts with every word if you want, and while you can have only nine fonts in memory at one time, you can easily replace one, two, or all nine fonts with new ones.

The first time I sat down with this program, I literally spent *hours* trying out all the fonts and features and pulling people over to my computer to “Just look at this!” By the way, if these fonts are not enough, there is a built-in font editor to create your own special fonts, either as regular fonts (9x16 dot matrix) or super-fonts (18x16 dot matrix). [Note: Superfonts look better, but not all

printers can print them well. Test first to make sure your printer can handle the superfont.]

I know I'm not really conveying the ease and fun of **FontMaster**, but let me assure you that you will find fonts here for every need to make your document distinctive and attractive.

Now while the ability to print in all these different type faces is lovely, there is more to **FontMaster** than a variation of **Print Shop** or **Newsroom**. Now, taking a deep breath, I'm going to give you a quick overview of this thoroughly remarkable program.

I believe I mentioned that you can print in various fonts, including several foreign languages. Suppose, in addition to printing in a certain language you wanted to write and edit in that language and see it on the screen. Could you do it? You bet! You can create alternate character sets as easily as you create alternate fonts (but all screen prompts stay in English). To further accommodate the use of **FontMaster** with foreign languages, you even have the option of right to left editing for languages like Arabic or Hebrew (a small “wow” is now permitted).

OK. So you just want to write in English. What can **FontMaster** do to help you? Between the embedded formatting codes (47 of them) and the text modifiers (27 of these), you can do darn near

anything you want. All the standard things are here; superscripts, subscripts, Pica, Elite, bold, underlining, expanded, condensed, justification, centering and so on.

But you also have a few things you might not expect; tall (double height, printed in two passes), normal, and micro height (half height, but not a subscript) print, choice of word wrap or not, on-screen underlining, inverse characters (white on black), multiple pitch, etc. Getting the idea you can do a lot with this little gem?

You also have all the editing options you would expect; search and/or replace, insert mode (my favorite way to type), block manipulation (move, cut, copy), tabs and more. There are commands to move your cursor from word to word, sentence to sentence, format command to format command, and modifier to modifier (I don't know of any other processor that does this) to make it as easy as possible to move around in your paper. Disk functions are accessible from within the program for your convenience.

There are some other touches which, while not absolutely necessary for a word processor, add greatly to your enjoyment, comfort, and the possibilities for creativity. For example, if you need to create form letters with the personalized touch, it's a snap with **FontMaster**, by marking the

spots in the text where you want to insert your personalization, creating a separate file of the information you want to insert, and letting **FontMaster** print your letters for you.

Another thing **FontMaster** offers you is the chance to see an 80-column preview of your work. Frankly, on the normal monitor screen you can't read the text too well, but you can see the shape of the paper, lineup of tables, need for hyphenation and the like.

Speaking of columns, **FontMaster** will let you print your document in columns (up to 4). A couple of embedded commands set everything up. You supply the margin settings for all the columns and **FontMaster** does the rest. This program could be a real boon to people who want to publish a newsletter in columns but don't enjoy cutting and pasting. With

the variety of sizes and styles of typefaces available to you, your newsletter can be stunning.

Other nice touches are the inclusion of a back-up disk and an easy reference card. I really appreciate a company who recognizes the realities of life, and knows that disks can get hurt. A back-up disk assures you of always having an original to fall back on. The reference card is a wonderful quick help if you don't feel like plowing through the (nicely done) manual to find the one specific command you need right now (but please read the manual — there is a *lot* to this program).

If even the quick reference card is too much trouble, on-line help is provided for you. Press the **CONtRoL** key and see all the commands which use the **CTRL** key. Shifted **CTRL** shows you another list, **Commodore Logo** key

another, etc. **Xetec** does everything it can to make this program a joy to use.

One last little convenience is in the matter of **LOADing** and **SAVEing** files. **FontMaster** will save files as either **PRoGram** or **SEQuential** files. It will also read either kind of file, and if you wish to read in a file created on another wordprocessor, **FontMaster** provides you with a translator program. When you're deciding whether to save a file as a **PRG** or a **SEQ**, remember the information about which fonts are in which slots, as well as information about **TAB** settings, are saved with a **PRG** file, and will be loaded automatically for you.

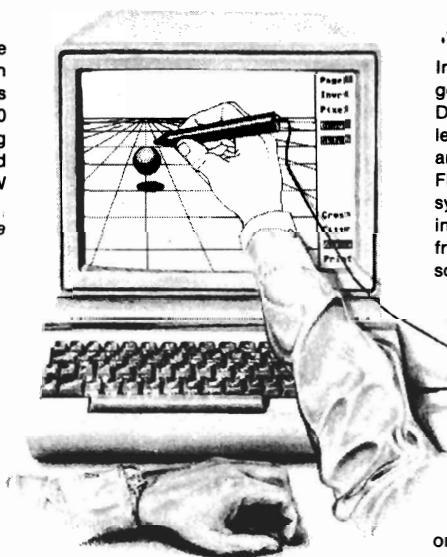
**FontMaster** works on the 64, and the 128 in 64 mode, and loads on the 1541 or 1571. The Setup mode allows you to select your printer and interface from a list of

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possible options, and then tells you which how the dip switches should be set to make things work. If you're wondering if it will work with your particular printer/interface combination, just check on the list below and find your equipment. (And, boy, will I be surprised if you *can't* find them!)

#### INTERFACES:

Xetec Supergraphic Jr.  
Xetec Supergraphic  
Cardco A, B and G  
GR&D GPC  
Axiom Parallax CD  
Telesys Turboprint  
Microworld MW-302 and MW 305  
Grappler CD  
Tymac connection  
Datashare PPI  
Printmaster/G  
BI Buscard  
Plus Others

#### PRINTERS:

Alphacom Aero  
Axiom GP-100 and SLP  
Blue Chip M120/10  
Brother M1009  
Canon PW-1080a  
CBM 1525, 1526  
Centronics GLP  
Citizen MSP 10, 15, 20, 25  
C.Itoh 8510  
Copal SC-1200  
DEC LA-120  
Diablo P10I, P12, P32  
Epson MX, RX, LX, and FX,  
both 80 and 100 series  
Epson LQ-1500  
Gorilla Banana  
GP 550CD  
HP 225 Thinkjet  
MPS-801 or 803  
Okidata 82 or 83 with OG  
Okidata 84, 92, 93, 192, 193  
Okimate

Olympia Compact NP  
K-XP1090. 1091, 1092, 1093  
Jr-P02U  
Prowriter  
Prowriter Jr.  
Riteman  
Riteman C , 15 and II  
Blue Plus  
SCM Fastext 80  
Smith Corona D100 and D300  
Star Gemini 10, 10X, 15 and 15X  
Delta 10 and 15  
Radix 10 and 15  
SG-10, 15, and C  
SD-10 and 15  
SR-10 and 15  
Transtar 315

Just one final word. In case you hadn't noticed, I really like this program. It gets an A on the Skelton scale.



This is a test of a lovely new word processor called **Fontmaster** which allows you to do **WONDERFUL** things with your **Commodore**.

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**PHHHUPTT\***

#### \*NOTE:

**PHHHUPTT** stands for the sound of a Bronx Cheer.

Not only is this word processor **very** easy to use, you can even do some things you can't normally do:

The time	many	And why the
has come,	things. Of	sea is
the walrus	shows and	boiling
said, to	and spins	hot, and
talk of	seeing	whether
	wax, of	pics have
	ceadpacs	wings.
	and kinds.	



# Alter Ego Affords Fun Chance To See What Might Have Been

by Randy Chase

Life is full of "what if's". Who hasn't wondered what might have happened "if" they'd chosen a different path at some distant point in the past? Maybe a change in careers, a different spouse, a different lifestyle, maybe even a different you? **Alter Ego**, from Activision, is described in the documentation as a "fantasy role-playing game about life," and by its designer, Dr. Peter J. Favaro, as an entertaining "life simulation." **Alter Ego** takes you on a humorous, intriguing, and sometimes thought-provoking journey into that world of "what if's . . . ."

When sitting down to review a new product, invariably the first step is to draw comparisons. Either consciously or subconsciously, it's only natural to begin by finding common reference points and to draw parallels with other similar products. As a somewhat jaded reviewer, I find that the most exciting products are those rare few that come along which are truly new and unique.

**Alter Ego** is much easier to play than it is to describe. In a nutshell, **Alter Ego** lets you explore that universe of "what if?" Utilizing a unique design, **Alter Ego** weaves a maze of inter-related life experiences, each of which forces you to select a choice of actions or reactions. Each choice has an impact on both the nature and well-being of the person your character is growing into on the screen before you.

**Alter Ego** divides life into seven stages: Birth and Infancy, Childhood, Adolescence, Young Adulthood, Adulthood, Middle Adulthood, and Old Age. While you can start your new life at any stage, the fullest impact of the game is only realized after you've grown and groped your way from infancy to old age.

Starting at later points in life, while offering a short cut to a series of experiences you may want to explore, is not without its price, however. I started one game in Old Age, which gave me the opportunity to explore the experiences in this module, only to discover that I was suddenly 72 years old, alone with no wife or family, had never held a job (and, of course, was penniless), and had nothing to look forward to but flirting with old ladies and waiting for the inevitable.

This is not a game to be won or lost, but rather a set of experiences and circumstances awaiting your exploration and experimentation. (In the interview with Dr. Favaro who designed **Alter Ego**, he is quick to explain that this is not intended to be a "self-help" program, but rather an entertaining game to be enjoyed.) There is no right or wrong, unless you count making a dumb decision that results in your early demise (and it's quite possible to create yourself a character that you wouldn't miss, were he to meet an early end).

Note that I referred to our fantasy character as a "he". No sexism intended there, just an appropriate description, as I've been

playing the male version of the game. **Alter Ego** is quite unique in that they have created both a male and female version of the game. The male version was released first, and we hadn't yet received the female version as this review was being finished.

**Alter Ego** won't give you 500 points for being a nice person instead of an egotistical jerk, but it does track the development and maturation of 12 different personality characteristics. Every decision you make as you take your new person through his life simulation is going to have an impact on various aspects of his personality and his life.

With the categories ranging from Calmness and Thoughtfulness to Happiness and Physical condition, you'll find yourself repeatedly consulting the Status Screen to see how your life is evolving. Besides these 12 characteristics, which are rated on a 100 point scale, you also have the opportunity to accumulate both financial wealth and material items ranging from the obvious things like a home and car, to home computers and stereo systems.

You'll start life with a small bond you receive as a gift from a relative, but once you leave the childhood stage, you'll quickly find yourself coping with the financial pressures of meeting the cost of living as well as paying for those things you impulsively bought on credit.

Each of the seven stages of life is a separate module to be played before proceeding to the

next, and each stage is unfolded before you in a road map filled with various life experiences for you to select for exploration. All experience modules are identified as to their nature, and since you won't be able to complete every experience contained in any one phase, you'll make choices as to what your priorities are. You may choose to concentrate on pursuing Intellectual experiences and neglect the Physical ones, only to discover too late in life that while you're an Intellectual giant, you're also a sickly wreck. They say that for every action there is a reaction, and that certainly seems to hold true in the simulated world of **Alter Ego**.

Life experiences are divided into several different types, each represented by an identifying icon on the road map for the stage of life you are currently exploring. They include Social, Intellectual, Emotional, Physical, Familial and Vocational. As you progress farther, in both years and experience, new options present themselves, including both high school and college, relationships, work, marriage, family, and material possessions.

Each experience contains a description of a situation or event in your life, along with a set of options available to you. The experience unfolds as you make your choices and react to the situation. Some experiences will offer you two radically different choices, others will provide a wide range of options and reactions.

In the earliest stages, you'll deal with learning to cry to get your mother's attention, manipulating your grandmother to get your way and advance to higher challenges such as learning to walk and even coping with the complexities of toilet training. In later modules you'll work your way through the awkward stages of adolescence, get your first job, court your wife, and, if you choose, start a family.

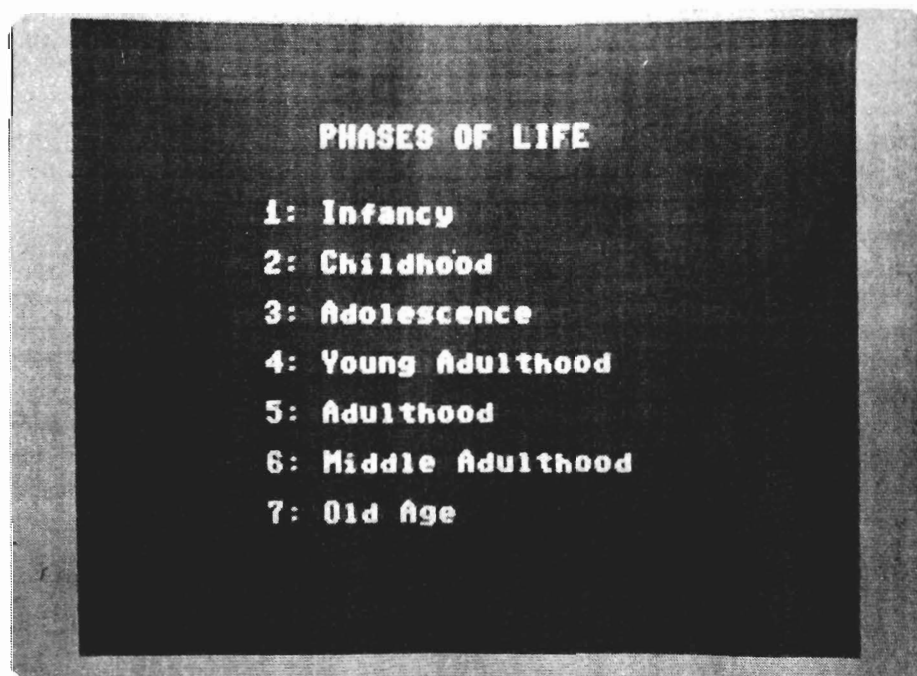
**Alter Ego** explores, as you progress, career related stress, adjusting to the trials and tribulations of marriage (even offering the option of divorce), raising your children, and eventually adjusting to the dictates of nature's clock. If you haven't guessed the eventual outcome of this, to quote and old and apt adage, "Life's a bitch, and then you die." **Alter Ego** provides for this eventual fulfillment of life's cycle in a number of ways. You aren't necessarily guaranteed that you'll be around to explore the experiences of old age. It is possible that you'll meet your maker sooner than you preferred. And no, friends, I don't believe in telling the ending of a story. If you want to satisfy your curiosity you'll have to die for yourself.

At the end of each stage of life, you'll receive what is basically a report card, or a state-of-your-life report, that will assess the development of the various areas

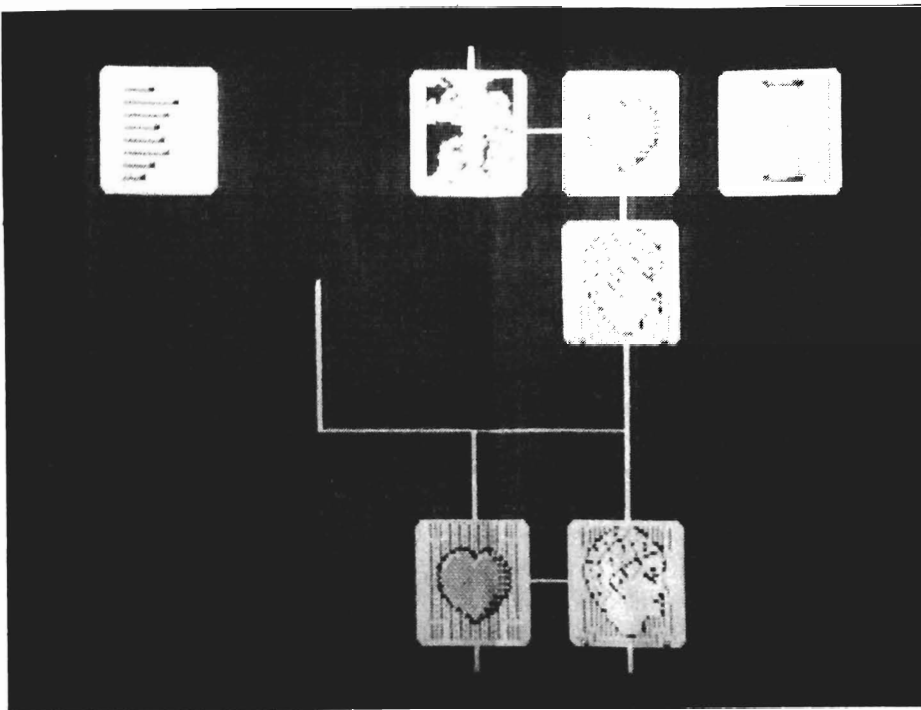
in your life. You can also, in the course of play, check the Status Screen for a bar graph status report.

Each of the 12 characteristics are rated on a 100 point scale. Anything below a rating of 50 indicates that you are weak in that area, and conversely, anything over a 50 indicates that your alter ego is advanced in that category. In trying to evolve your alter ego into a well-balanced person, you will try to maintain a balance between the various categories (unless, of course, you want to try life one time as an intentionally obnoxious oaf, in which case you might disregard all of this advice).

Keep in mind that each time you make a choice from the options offered by a particular life experience, several categories of your personality will be affected. While tackling the additional pressure of some work-related project may advance your vocational ranking, it may adversely



**Menu offering you the seven phases of the life cycle for you to choose. Each level offers a unique set of experiences.**



Icon map scrolls up and down presenting the user with a selection of experiences. Head icon pertains to intellectual development; multiple heads, social; heart, emotional; etc.

affect your calmness and physical well-being. And while that daring romantic fling with your college roommate's girlfriend may temporarily raise your happiness, it may also have a long-term impact on your Trustworthiness.

But, then, this is **Alter Ego** and if you choose to pursue every romantic option life offers and disdain all other responsibilities, go ahead — throw caution to the wind and explore both the experiences and the eventual consequences of your actions and choices. The nicest thing is that once you've finished, you can go back and start over and try it another way.

Scores, or ratings, in these categories are not necessarily good or bad. Instead, they reflect the balance and development of your character. It is also not possible to become a "perfect" person, since the 12 categories are quite inter-related. For instance, your rating for Gentleness is directly balanced

by your Agressivness, rendering it impossible to achieve high rankings in both at the same time.

In some situations, you'll find that a high Gentleness rating may be an asset in asking a favor of a friend, and at the same time be a detriment in seeking a job where a high Agressiveness rating would be to your advantage.

**Alter Ego** overall struck me as being very realistic. The vast majority of the experiences and situations were based solidly enough on reality to score a scenario that was quite believable. One aspect of this reality that warrants mention is also mentioned in the warning on the package about the "explicit material" contained in the game.

Yes, in their attempt to offer a realistic and comprehensive simulation, Activision is to be credited for their willingness to give Dr. Favaro the freedom to include some of the sexual aspects of life in his role-playing game. For a product that is being mass-

distributed through the traditional retail network, this is an admirable statement on the part of the company to trust the judgment and discretion of the consumer rather than to offer arbitrary and judgmental values that would limit the scope and comprehensiveness of the package.

It should be explained that any time an experience contains any sexual material, the user is prompted with a warning and an option to escape this scene. Subsequently, those who fear they may be embarrassed or offended can avoid such episodes. However, in fairness, (and before anyone rushes out to buy **Alter Ego** hoping for some cheap electronic thrills) it's important that the nature of these sexual experiences be explained.

While I found they were quite realistic in nature, they are neither explicit nor erotic; rather, they offer some plausible situations and experiences that are most definitely a major part of life. Situations range from adolescent understanding of the physical changes involved in puberty to the social implications of a quick fling with your college roomie's girl friend.

I don't doubt that someone, somewhere, will find some of these experiences offensive. I don't think it's possible to approach *any* sexual material without having someone condemn it; but I can't really see anyone having any valid objections to this "explicit" material.

Since I just happen to have my soap box handy, I'd speculate that the few people who might take offense at these very tame and "un-sexy" sexual episodes would probably argue that sex is something that should never be discussed, and should not be revealed to children until the day they get married. Not only is any given episode of *Dynasty* far racier than anything you'll stumble across in **Alter Ego**, but also, in all candor, the public chatter on



many of the telecommunications networks is far more explicit.

Overall, I found it very hard to find any real criticisms of **Alter Ego**. It's hard to fault a product that is so ambitious in concept and comprehensive in detail that it requires three double-sided disks to contain it. The icon-driven design of **Alter Ego** made it very easy to play, and the manual is quite thorough in graphically guiding the new user through the

mechanics of the game, leaving the player free to focus instead on the twists and turns of the simulation. Perhaps my biggest surprise was the discovery that when I had finished playing **Alter Ego**, I really wanted to start over again.

If you're tired of shooting aliens, weary of deciphering riddles and stumbling through mazes, and are looking for something truly unique, I wouldn't hesitate to recommend **Alter Ego**. Not only

will it entertain and captivate you, but it also has great potential as a party alternative to computer trivia games.

Following this article is a transcribed telephone interview with Dr. Favaro, the creator of **Alter Ego**. He has some interesting comments to share with us about the program, and how it came into being.



## Interview: Dr. Peter J. Favaro

“ . . . leave your psychology one textbooks on the shelf at home and play it for fun.”

**Randy:** Let's start by giving our readers a little information about your professional background.

**Dr. Favaro:** I'm a New York based clinical psychologist who works with children and adolescents; and teaches in the psychology, education and computer science departments at Hofstra University, in Hempstead, NY. I'm also a computer game designer.

**Randy:** How did a clinical psychologist end up designing computer games?

**Dr. Favaro:** Back when there were only Pong-type games, I did my masters thesis on whether or not children could learn anything else as a result of playing these eye-hand kind of games. From that, I did my doctoral dissertation on whether or not violently-themed

video games affected human behavior in any way. That was of great interest to the Surgeon General, as there was a big controversy at the time. After we get our PhD, there is usually about a year of time that passes between your doctorate and your ability to practice psychology in New York state, so we all have to do something to make a little money in between, so I started designing my own games.

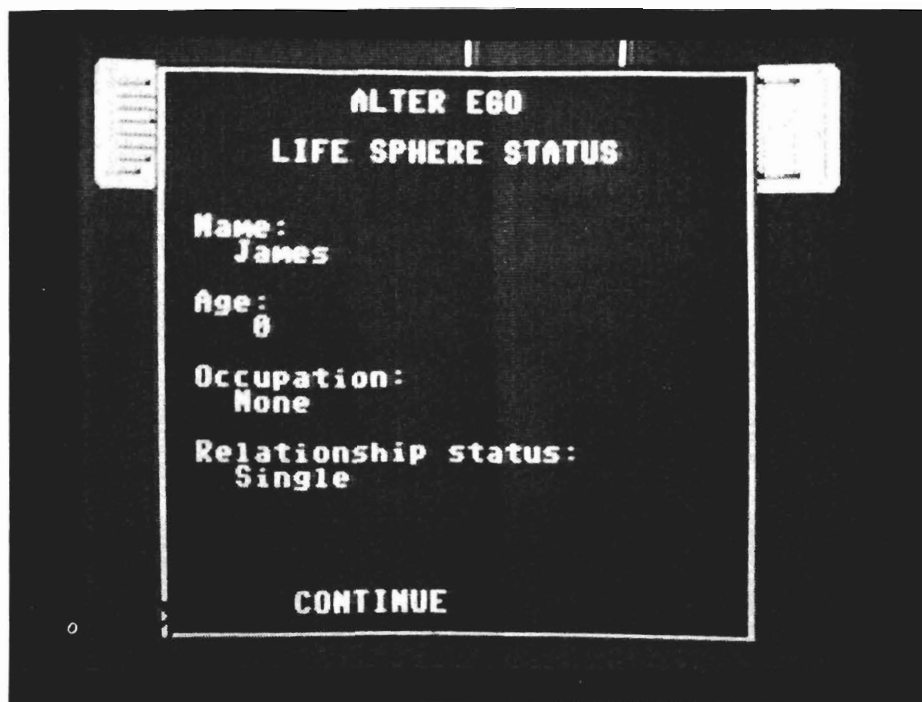
**Randy:** What were the conclusions you reached in your two papers?

**Dr. Favaro:** That the only thing that video games are good at is teaching people how to play other video games. And that violent themes generate violent kinds of behavior regardless of whether they are video games, TV programs, or other non-video

oriented kinds of activities; but that interestingly enough there was an interaction which showed that of the three kinds of activities we took a look at, the video games fostered the least amount of aggressive behavior in players.

**Randy:** It seems that psychological games are the latest trend in the entertainment software field. What kind of reactions have you gotten from your professional peers to **Alter Ego**?

**Dr. Favaro:** Well, at the university, they're kind of used to me doing peculiar things with psychology, and they are very supportive. I have not had any feedback from other colleges because the game hasn't really been out long enough for it to filter through to some of them. I know that clinical people in Rhode Island



Selecting the bar-graph icon brings up this status report, giving you a report on the various levels of development of your character.

have shown some interest in using the game. There has also been other support that I've been receiving from other psychologists.

**Randy:** Is this your first software product, or have you previously designed others?

**Dr. Favaro:** I've done a whole bunch of programs for a place called Altro Health and Rehabilitation which is an institution in the Bronx which treats chronic schizophrenic populations. I've developed some simulations for them that help the patients over there to concentrate better, to organize themselves better, and to use computers in general. I've also done some public domain educational software that was published through what was then *Popular Micro-Computing* magazine.

**Randy:** What was the spark that prompted you to design *Alter Ego*?

**Dr. Favaro:** Well, I've always had an interest in trying to teach people that one of the best ways of coping with life — or adapting to life — was to develop a good sense of humor. I gathered 500 interviews, much like the one we're doing right now, with people of all ages and stations in life, from all over the country, transcribed those interviews and found out which experiences were both common and poignant and tried to write them up into humorous vignettes because nothing satisfies people more than the ability to look at themselves and get some enjoyment out of it and live out fantasy-like experiences.

**Randy:** Do you think that your background with children was a big factor in your ability to design *Alter Ego*?

**Dr. Favaro:** Yes, my expertise with children certainly made it easier for me to develop the earlier modules, (the infancy, childhood

and adolescence modules). It was much more difficult for me, now that you bring it up, to do the later modules (the old age and the middle adult ones) — not only because it's a part of life that I haven't experienced, but also because it's a population of people that I typically don't work with on a daily basis.

**Randy:** We haven't seen the female version of *Alter Ego* yet, and I'm quite curious about both the degree of difficulty in creating two different versions of the game, and just how different are they?

**Dr. Favaro:** There were a lot of interesting issues that came up in developing the female text. The first of which is that I am not a female so I have a certain kind of built-in biological bias which made it much more difficult. We hired a panel of females, and we ran the text through another group of females who read through the text to keep me honest. Now, the text is not different in the male and female versions. The experiences are not different but they are written from a different perspective. I shouldn't say that they're not different; some are complete replacement experiences for which there simply are no parallel experiences in the development of males, and some are written from a completely different perspective and some are exactly the same. I would say that 30–40% of the game was completely rewritten for the female version, but that the rest was written from a different perspective, and that a small part was left exactly the same.

**Randy:** This is the first product I'm aware of that offers both male and female versions. Did you originally plan two different versions, or were you forced by the size of the project to divide it into two packages?

**Dr. Favaro:** When you're dealing with 1,500,000 characters of text it

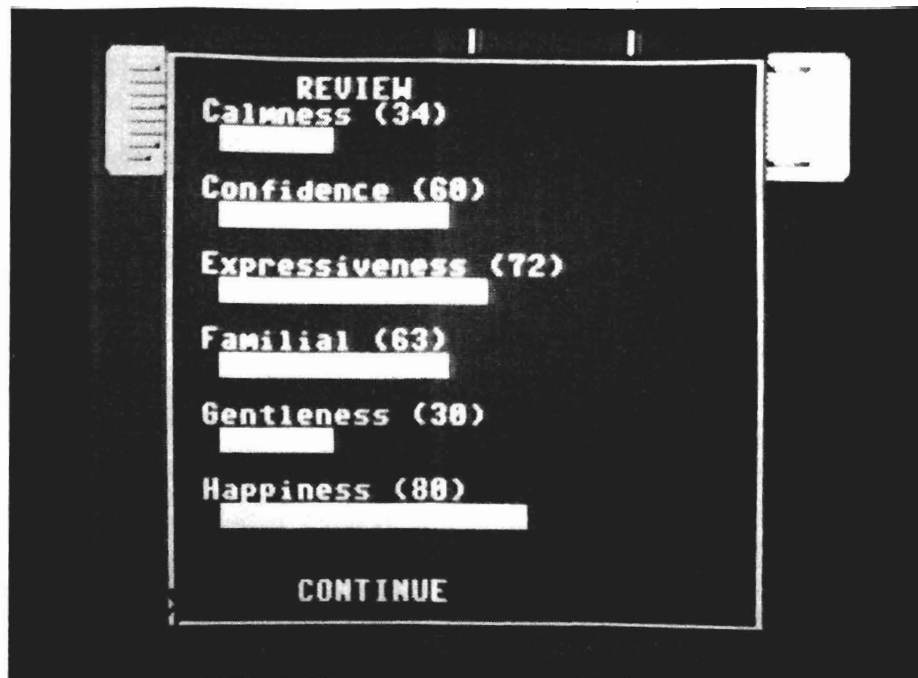
becomes an unwieldy kind of project to do all in one package, so there was the space limitation there, and also the fact that it seemed like a good enough product to bring out and present in both a skew for males and a skew for females.

**Randy:** How long did the development take, both to design the game, and then to accomplish the actual programming?

**Dr. Favaro:** Well, the specs were very vague at first because we didn't quite know where the game was going to take us. Activision was wonderful enough to let me have much freedom in developing those specs in a way that I felt would best suit the product. The interview portion, the actual research phase of the project (and it was research in the truest sense) took approximately four months, and generated five or six thousand pages of interview material. The next phase was actually writing the text, which took the shortest amount of time (three or four months), and the programming took about six or seven months. In the course of the programming we developed a completely new language to deal with the different iterations and branches in the text. It is a text language that is embedded in the text and drives the program.

**Randy:** I'd be interested in getting a few comments from you about some of the various psychological-type programs on the market. We seem to get widely conflicting comments from those with a professional background as to the validity of these kind of products.

**Dr. Favaro:** First, let me clarify something. **Alter Ego** is *not* a psychological self-help product at all! It's strictly an entertainment game, written by a psychologist to entertain — not by a psychologist to teach or to do therapy or anything else. We went to great pains in building the documenta-



You may check on "how you're doing" at any time. Here is the second page of the status report.

tion and in creating the packaging to do that. Just because I'm a psychologist doesn't mean that everything that I do is psychotherapeutic in nature. Psychologists can also do things to entertain. **Alter Ego**, as a life-simulation, you have to understand, is a very closed-life situation. We don't pretend to do the same thing that **Mind Prober** intends to do. And we don't pretend to do the same thing that **IntraCourse** intends to do. We don't want people to take this seriously. We just want them to have fun.

**Randy:** I didn't mean to lump **Alter Ego** into the category of the self-help programs on the market, but I would be interested in your comments and reactions as a psychologist, to those other products that are currently available, and particularly, any comments or ideas you have about this new trend in software.

**Dr. Favaro:** Well, there's a big controversy about media psychology in general right now. I never really considered myself to be a "pop" psychologist. I think that some of the media psychologists do an excellent job of giving very pragmatic types of advice — and some don't. I think that if the kind of information they provide is similar to the kind of information that, say, a Leo Buscaglia book provides, and makes people feel good, then I would say that stuff like this is good. But if it's nothing more than an electronic version of waving a dead chicken over somebody's head and saying that this is going to predict something about their personality, then that is something that I completely disagree with.

**Randy:** To move back to **Alter Ego**, I have to admit that I haven't dealt yet with the old-age phase.



Am I safe in assuming that the final life experience is death?

**Dr. Favaro:** Yes, it is! You can kick the bucket in quite a variety of ways. Some of which are poignant, some of which are kind of humorous, and one in which you go off the end of the board and kind of re-circle back towards the beginning.

**Randy:** One area we should talk about, especially considering that the world seems to be full of people determined to make moral judgements for others, is the reaction so far to the sexual content of **Alter Ego**. What kind of response have you received so far, and what comments might you share about the sexual nature of **Alter Ego**?

**Dr. Favaro:** For one thing the sexual content is "sexual" but not sexy. It's the same kind of sexuality that you would use to talk about sex on a day to day basis without getting graphic or pornographic or without attempting to arouse. Those experiences are a part of life. They came out in the interview data, and we tried to present them in a way that was tasteful. We tried to present them in a way that if people wanted to avoid them, they would be able to do so. And in terms of content in general, I would say that people are going to get offended by lots of things, and sex is right up there on everyone's list. So we were concerned that most people wouldn't

be offended, but we knew that some people would be.

**Randy:** Are there any comments that you, as the designer of **Alter Ego**, would like to pass along to the people who are playing it?

**Dr. Favaro:** The biggest suggestion that I would have is to leave your psychology one textbooks on the shelf at home and play it for fun. Try to resist the temptation to play the game often as yourself. Everyone wants to play the game once as themselves to get it out of their system, but you really should explore the many different kinds of choices and paths and to not take it too seriously and to have as much fun as you can.



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ABSOLUTE	DUMP	MODES	SAVE
AND	DELETE	MINUS	SYNC
BUFFER	ERROR	NATURAL	SYSTEM
BUG	FILE	NUMBER	SEARCH
BREAK	FLAG	OF CODE	SUBTRACTION
BASIC	FILL	OFFICE	SINE
BYTE	FREINDLY	PERIPHERALS	SET
BINARY	FLOATING	PSEUDO	SHIFT
CIRCUMFLEX	GATES	PULSE	SPREADSHEET
CARRY	IMMEDIATE	PAGE	SOURCE
CASSETTE	INTERUPTS	PADDDLE	TRACE
CATALOG	IMPLIED	PROGRAMING	TABLES
COF Y	INTEGER	POINTER	TABS
CURSOR	INJECTED	RELATIVE	UNCONDITIONAL
CALL	INDIRECT	RAM	USER
CPU	JUMP	REPEAT	VARIABLE
COMMAND	KEYBOARD	REGISTER	WINDOW
CONVENTIONS	LABEL	REPLACE	WEDGE
CONSTANT	LANGUAGE	REM	ZERO
DOS	LOW	ROM	ZEND

U I G L U N C O N D I T I O N A L C C Z E K O W A F O L N F S E A R C H E Y O  
 P I C A S S E T T E I O D V E Z M J C E I A J V V A K I A B L E F A N Y I V T M Z  
 Y B G L A T A C L F H I S Y D Y N V C Y K A N I B V T N A T I A W A C  
 Z O O A G A T E S Z T A H M N F D T C H C J F D E C I M A L A N D S R C A P D  
 I A C C U M U L A T O R K S E E L I Y I W Y D M F K O Z F L P V D L W G E L  
 O Y J E T U L D S B A D T H Y A L T H A R F M M E M O N I C S O L F N C K  
 F O I N T E R X V T G A G E Z H I M P F E L M E S S A S I D G G I J E T D D  
 U O F C O D E X T O K A C V L S F N J C F V B J N J J W S E N B L O U C J U  
 A D D I T I O N G T I N E S F N P B J I M V A F T Y H V U T G V U I K E E M D I  
 D M T H V G S T I T I R F V Z L O W S G S R C C F U L S E N T I J G J G T F F  
 B A I C S T F U I T R Y F R E S L A J F J V H J W M U G F M G O X O T D T J F F  
 F F M S C I E F C M U S Y T B J V T I J H L A N G U A G E Z S I G I R Y V T  
 T Z I Y H D G E N E L E U M Z F N A G E M I N T E G E R U N N V V J J E  
 A F F S G O E D L C M K A J F D T D E F F E D E L E T E Y S A F C O L Z K C I  
 F Z M L F G F N S R M J O E X C H M T G S N O I T N E V N O C M M P U C E L  
 S E V Y F F T D E I L F H I M B Y U A K F C Y A J T I O Y V E S G F C G F T  
 E F A M I D A Z H A T U K A L Z J G A U A R M F T I T V N A T I O G F L L  
 U O L C I E S I Z I V I C C U F S O F N K D L K Y F M T H T A Y L Z C L J  
 D X E M C S V B I E E L Y F U C L A E I C H M L A N K N E S V I F X W F  
 O P M T A D D Z I Y S F M T N D G E F E F C F M O C S I F W U M N M M O  
 C R J A F I A M B A R A D N Z T E L O R E N H O U I C I N J C U M Z I I  
 T B D F A J Z O B U A T E O G A L A A T H M Y O H L X T L A M C C B F L  
 R O B Y T E A A D V U E C I O C E M F G A L F A C F L O E E C C K A F M  
 Y E S F A R I A A S V E U T E K C E V C L K N F I C A D J F L R U I F I O F  
 G E U I D A I H M I W M C E L G J D O S Y U N S S L K A S O S U C C Z Y  
 C N M F O A E N I S K A U E F W D G N I M F U E J K H A T I O G F L L  
 P M I V D T G L E F R S M H Y A Y E L A G H J T A E E N T U C L  
 P L M T H D I C O M V A A T I V I X S Y V U M D G C H V F G T U I S N S G  
 R W O X A F U G F K E E B A H N D N C V Z E Q U I Z U E A V S E J R N Z H  
 D Y Z C M G F G E M X K H U L D A I B H M P F A L J I A S H E E G A L F  
 G I T U C S L M B D F S U A I I C L M G H F T G S E D F S I R K O B  
 K I A E S D O F F I I A S V L G Z T F T N Y J D D V I U F E S Y F C S I A F F J  
 A F E A S F N M S G D C A J O R E A N S J F Z F M I D V F N E A T E T L G  
 M J F X S E N M D L A B K A F C J I C E Z F E L M I D N I E L C U A P O M I  
 I J E D I R D F E L J V A H F T E I C V D D T I V A E C L F R S L R M D G  
 M E H L Z I I F E R S O M J A N V E O L H D R A A L E G L E G I E H  
 G O M E N U M B E R Z U A G D T D A L E C K A U S A Z T T J A J S G K D I E H  
 V B F Z X X A C H Y M X Z Z N T H V P A D J X A F M S I D J P N E F R  
 A T G D F M A N A G E M M I C R O S O F T U M I G E I M P L E H S V S S Y

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ALBERTA	KUWAIT	RALEIGH	LOUISIANA
ALBANY	LISBON	RUMANIA	MILWAUKEE
ALBUQUERQUE	MOSCOW	SEATTLE	NICARAGUA
ALBUQUERQUE	MEXICO	TORONTO	OWASAWA
ALBUQUERQUE	OTAWA	TRENTON	STOCKHOLM
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 N Y O R K I A S A S B R I T A I N I M  
 E U I R A N E T U F A T L A N T A L  
 T W I O H D O H U F A T L A N T A L  
 H A B O T T O N R O M E S U P E R I O R S P N C U  
 E S I L A S L A T N G H I C C O  
 R I H A R T F O R D S A T H M  
 L I N U T R I N I D A D E P  
 A N Z O K L A N D S E A T T L E S Y T N  
 D T A S E T O E T E E H  
 S T O C K H O L M Y U N N R D O A F L O R I D A  
 N S G U A T E M A L A D O N F L O R I D A  
 A P I B A A M N P H E N I X  
 R B S A C R A M E N T O H K M O N T G O M E R Y N  
 N I C A R A G U A O L O R S W E D E N  
 Z R H T A L L A H A S S E E S V C  
 O C A K V C M I L W A U K E E I E  
 M E R L I S I N G A P O R E A C I N C I N N A T I  
 A L B U Y A N A A R M C I N C I N N A T I B O  
 L H S D L N A L B A N Y  
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# Multi-tasking the Amiga CLI

## The Ball is in Your Court

by Grant Johnson

Up to now, most personal computer users found that working with their machines fell into a "natural" rhythm, once you knew the machine well. Once you'd learned how to get the ball over the net reliably, all that remained was a series of volleys until the game was over. A job would be assigned, the computer would do that job while you waited and report back for the next job. If the machine was fast (and expensive) your turn would come sooner. Only occasionally, such as in a flight simulator game, did the machine and user seem to occupy the same time frame.

Well, I have good news and bad news about the Amiga. I am one of those people who felt it was somehow efficient to keep the machine occupied. I had a sense of pride in being able to keep the ball in the computers end of the court for goodly stretches of time. Fetch this file, print that and, if I needed to refill my coffee cup, I could always format a disk.

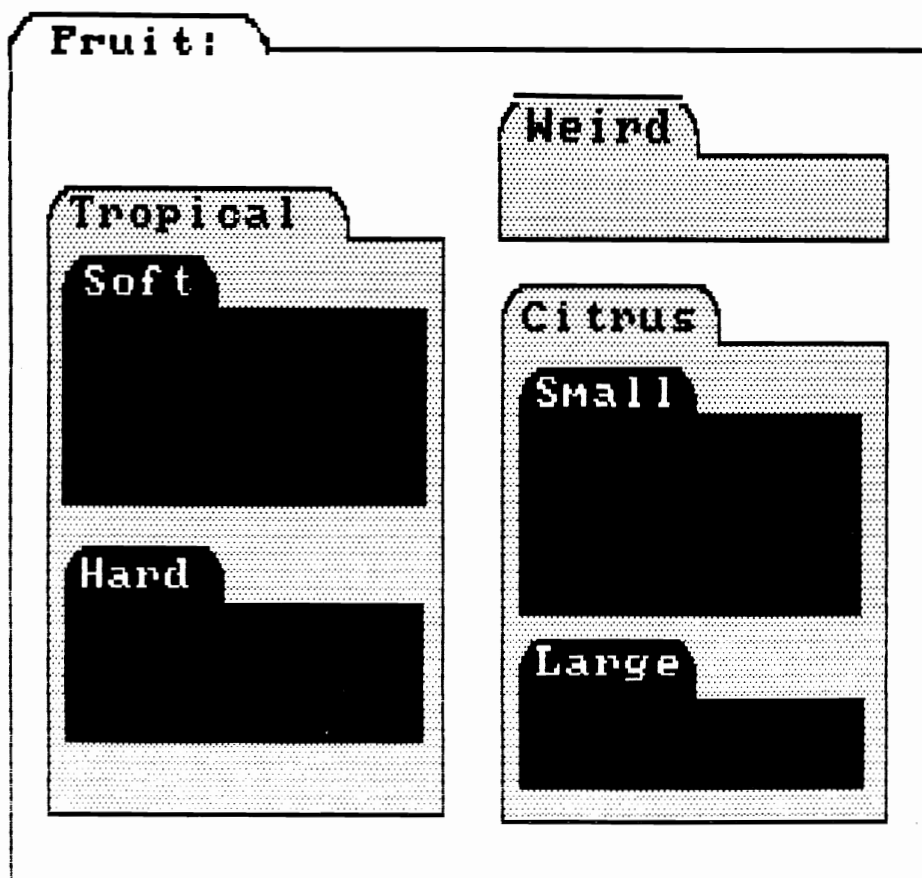
The bad news is that if you regard the blinking cursor as a challenge, you're going to have to change your ways or the Amiga will be as hard to ignore as a hungry baby.

### It's your turn

The Amiga is programmed to keep a ball in your end of the court, even if it has to use *many*

*balls* to do it. The only sane way to live with an Amiga is to accept that it is going to spend most of its life under employed. But the good news is that the machine deploys its considerable resources in a flexible manner. It is your time frame that is paramount. You hand off jobs to the Amiga as they occur to you, and the machine completes them as it can.

Last month we began exploration of the Command Line Interface (the text way of talking to the Amiga) with one CLI window. This month we look more deeply into the structure of files and will use the machine's multi-tasking abilities to illustrate. Oh, and along the way we'll pause long enough to look at the Amiga's screen editor.



Empty Directories



When you call up the Command Line Interface, two things immediately happen; a CLI window is opened on the screen and the keyboard is "connected" to that window by the computer. These two elements (keyboard and screen) form, in effect, a computer terminal. The computer listens to what we do on the keyboard, echoes this to the screen so that we can see what we're doing, and uses the screen for messages of its own.

The Amiga's CLI system is a relative of Unix, and like it (and many other operating systems) is infinitely expandable. Well, as infinite as memory storage. Any program can be run simply by typing its name. Forty-three such programs, usually thought of as commands, can be found in the Workbench disk filed under the "c" (for command) directory.

One of these programs is of special interest to those wishing to multi-task under CLI. It is the NEWCLI command. When performed, this opens another CLI window — this time with a "2>" prompt. Our original CLI window remains on the screen with its "1>" prompt. This new "2>" indicates that this is the second activity under CLI. Should you enter a command on the keyboard, you will now find it echoed in the new window next to the "2>" prompt. What we have here is, in fact, a second terminal. You can do *anything* with this new terminal that you could do with the first —

including open another CLI with the NEWCLI command. You can initiate up to twenty of these.

### Creating directories

In preparation for working with multiple CLI's, let's set up a brand new disk with files of our own choosing. In this way, we can keep clear about what we are working with. CLI commands can be followed by comments if you precede the comment with a semicolon. (You may find it helpful to look at the "block" diagram to see where we are headed with this. Also see box "What's in a name?")

```
1> FORMAT DRIVE DF1: NAME Fruit
;This formats a new disk with the disk
name "Fruit". Fruit is the name of the
root directory.
```

Insert disk to be formatted and press RETURN.

```
Format cyl 79
Verify cyl 79
```

```
Disk "Fruit" formatted and initialized.
1> CD Fruit: ;Change the current
Directory to the new disk.
```

```
1> MAKEDIR Citrus ;Create a sub-
directory called "Citrus".
```

```
1> CD Citrus ;Current is now the sub-
directory Citrus.
```

```
1> MAKEDIR Large ;Make a sub-sub-
directory within Citrus.
```

```
1> MAKEDIR Small ;And another call-
ed "Small".
```

```
1> MAKEDIR :Tropical ;Colon tells
AmigaDOS to return to root directory
before creating this directory.
```

```
1> CD ;CD command without
```

parameter asks DOS "What is the current directory?"

```
DF1:Citrus
```

```
1> CD :Tropical ;Change directory to
Tropical.
```

```
1> CD ;Where are we now? (Answer
below.)
```

```
DF1:Tropical
```

```
1> MAKEDIR Soft ;Create a sub-
directory to Tropical called "Soft".
```

```
1> MAKEDIR Hard ;And another call-
ed "Hard".
```

```
1> CD : ;Change back to root
directory.
```

```
1> MAKEDIR Weird ;Make a directory
for Weird fruit at the same level as
Tropical and Citrus.
```

```
1> DIR Fruit: OPT A ;Print complete
(OPT A) directory to screen.
```

```
    Weird (dir)
```

```
    Citrus (dir)
```

```
        Small (dir)
```

```
        Large (dir)
```

```
    Tropical (dir)
```

```
        Soft (dir)
```

```
        Hard (dir)
```

### Meeting ED

At this point, we have a disk with up to three levels of directories. A disk would be of little use if all you could put on it were directories, but there is no ready-made DOS command such as "MAKEFILE". It is rightly assumed that such files will come into existence in the natural course of use. In making our Fruit disk a more typical example, I went on to create some simple text files with

### Screen Editor Control Key (Immediate) Commands

CTRL A Insert a line.

CTRL B Delete a line.

CTRL D Scrolls text one page Down.

CTRL E Toggles cursor to top/bottom of page.

CTRL F Flips upper/lower case.

CTRL G Repeat last extended mode command line.

CTRL H Same as BACK SPACE key.

CTRL I Tab right.

CTRL M Same as RETURN key.

CTRL O Delete spaces or word.

CTRL R Jump cursor to end of previous word.

CTRL T Jump cursor to start of next word.

CTRL U Scrolls text one page Up.

CTRL V Verifies (rewrites) screen.

CTRL Y Delete remainder of line.

CTRL [ Same as ESCape key.

CTRL ] Toggles cursor to left/right end of line.

Figure 1.

### Extended Command Summary

A/s/	Insert line After the line the cursor is on (where the "s" is a string that will be placed on the new line).	IF/s/	Insert File (file identifier is string s).
B	Go to Bottom of file.	J	Join next line with current. Inverse of RETURN.
BE	Set the Block End at the cursor.	LC	Discriminate between upper/Lower Case in searches.
BF/s/	Backwards search (Find) for string (/s/) from cursor to start of file.	M n	Move to line number n.
BS	Set the Block Start at the cursor.	N	Jump cursor to start of Next line.
CE	Jump Cursor to End of line.	P	Jump cursor to start of Previous line.
CL	Same as cursor left key.	Q	Quit (does <i>not</i> save text).
CR	Same as cursor right key.	RP	Repeat command until error (such as end of file).
CS	Jump Cursor to Start of line.	S	Same as RETURN. (Only way you can get it in extended command line).
D	Delete current line.	SA	Save ED file to current disk file.
DB	Delete Block.	SA/s/	Save ED file to file name s.
DC	Delete Character (Same as DELeTe key).	SB	Show current Block on screen.
E/s1/s2/	Exchange occurrences of string 1 with string 2.	SH	SHows file size, tab setting, file name, etc.
EQ/s1/s2/	Same as above except that ED queries "Exchange?" before it acts (answer is Y or N).	SL n	Set Left margin at column number n.
EX	Extend right margin.	SR n	Set Right margin at column number n.
F/s/	Find string (s).	ST n	Set Tab distance at n characters.
I/s/	Same as A/s/ except insertion before current line.	T	Jump cursor to Top (start) of file.
IB	Insert Block. Doesn't delete source block.	U	Undo any changes on current line.
		UC	Upper/Lower Case — inverse of LC.
		WB/s/	Write (save) Block to file name s.
		X	EXit (Saves current file.)

Figure 2.

the ED command. This is one of the two editors supplied with the computer. ED is the "screen" oriented editor; the other, EDIT, is a line oriented editor.

If you invoke ED with a file name that does not exist in the current directory, the system creates a file by that name. If the file exists, ED brings it to the screen for any changes you might wish to make. The ED command also accepts a SIZE parameter that sets aside an area of memory for a "buffer" or work area. The default value is 40,000 characters, more than enough to get us started!

```
1> CD Weird ;Sets Weird as current
directory.
1> ED Kiwi
```

At which ED checks to see if there is a file called "Kiwi" in the directory "Weird". Finding none,

it opens an empty screen window with a waiting cursor and a note at the bottom of the screen that a file is being created. Had it found such a file, it would have loaded it into memory for editing.

ED behaves very much as the other Commodore screen editors you may have worked with (such as the ones that are a part of BASIC on the '64 and 128 PC) with the following exceptions: ED is *always* in insert mode. You cannot "type over" anything, but must delete it first. The DELeTe key deletes the character over which it rests, and the BACK SPACE key deletes the character to the left of the cursor (BACK SPACE does what DELeTe does on the '64 and 128).

The RETURN key takes some getting used to for Commodore veterans. It does a line split. That is, it terminates the line at the location of the cursor, and, if there are

characters to the right of the cursor, they are moved down to a new line. The TAB key jumps you along the line three characters at a time, a default setting which is just right for indenting structured program code such as C or Pascal.

### Immediate commands

There are actually two ways to give commands to ED; immediate mode and extended mode. Immediate commands are either given with special keys (TAB, Cursor keys, etc.) or with the Control (CTRL) key pressed down. (See **Figure 1** for a list of immediate commands.)

### Extended commands

The extended command mode is entered by pressing the ESCape key. The bottom line of the ED screen is reserved for these commands, and, when ESC is pressed, an asterisk appears on this bottom line. The characters that you type

## What's in a name

With multiple levels of directories being the norm in Amiga files, simply giving the name of a file may not be enough. Two special characters are used to form "path names" that keep it clear to the computer precisely what file you have in mind. The first character is the colon (:). It is used to indicate the root of the file tree. Every disk has at least one directory on it. The identifiers (names) used in association with it are of two types. First, there is the device designation, such as "DF0:" which tells the machine that the disk you are interested in is in drive zero. An alternative designation is to use a "volume" name. Our example disk has a volume name of "Fruit:". Either type is okay with the computer, but, with the first, you must know what drive the disk is in and, with the second, you must know the disks name. If you don't know the

disks name, use the device type identifier, and, if you don't wish to keep track of which drive the disk is in, use the volume name.

The other special character is the slash (/). Simply put, you use it each time you cross into another directory. Referring to the block diagram of our example disk, to get from "outside" the disk to the "Small" directory we could use the path name "Fruit:Citrus/Small". Fruit: tells the machine which volume (disk), Citrus tells it which of the entries in the root directory we are interested in, the slash tells it that we are crossing the border to the next level of organization and Small designates the file within Citrus that is our target.

Typing path names can quickly become burdensome, so the disk operating system allows you to designate any directory as the current one. We could tell the machine:

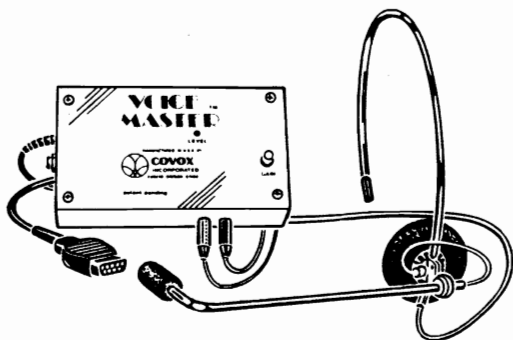
1 > CD Fruit:Citrus

Citrus would be the current directory, and to reach Small or Large we would need only to name them. Once you have moved to a current directory, you can use the same special characters to back up. The disk operating system only "knows" what is in its current directory, so, for example, if Small was the current directory and you needed something from Large, you could back up with:

1 > DIR /Large

The slash sends the system back to the Citrus level before trying to find Large (and print) its contents. Again with Small as the current directory, to go all the way to Soft, you would need the path //Tropical/Soft. The colon by itself is enough to indicate the root directory so this last example could be replaced by :Tropical/Soft. Just remember that when you cross to a different level of organization, you will need either a colon or a slash.

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thereafter appear on this line. I like this feature a lot. It gives me a chance to review what I am doing before I set ED loose on my commands with RETURN.

Strings are shown enclosed in slashes /, but you can use any character you want except the asterisk. Just be sure that you use the same character to end the string as you used to start it with, and that the character you use does not appear in the string. (For example: !This is a string.! %This also.%) Double quotation marks (") and asterisks (\*) may be used, but must be introduced with a preceding asterisk. (For example: /THIS IS \*"THE" STRING/ is THIS IS "THE" STRING.)

By my count, there are 39 extended commands, (see **Figure 2**.)

Multiple commands can be entered if they are separated by a semicolon. By the way, undo (ESC U RETURN) works only until you leave or delete the current line. Many of these commands can be repeated a given number of times. You simply precede the command with the number of repeats that you want. ESC 4N RETURN jumps down four lines.

The procedure I used to create the text files is perhaps best illustrated by an example:

```
1> CD FRUIT:Weird ;this sets Weird
as the current directory.
1> ED Kiwi ;Calls Ed which looks for
Kiwi within directory Weird.
```

*EDit screen appears, and ED, not having found file Kiwi, assumes that we wish it created. A message that a new file is being created appears. Text is next entered:*

The meat of this small fruit looks like emerald green strawberries, but the skin is a hairy brown.

The whole sequence is ended when I press ESCape and X, thus saving the file and eXiting ED. The text files added in this way were "Lemons", "Oranges",

"Grapefruit", "Bananas", "Mangos", "Pomegranate" and, as mentioned, "Kiwi". After ED was used to create these files, our sample disk yeilds:

```
1> DIR OPT A
Weird (dir)
  Kiwi
Citrus (dir)
  Small (dir)
    Lemons      Oranges
  Large (dir)
    Grapefruit
Tropical (dir)
  Soft (dir)
    Bananas     Mangos
  Hard (dir)
    Pomegranate
```

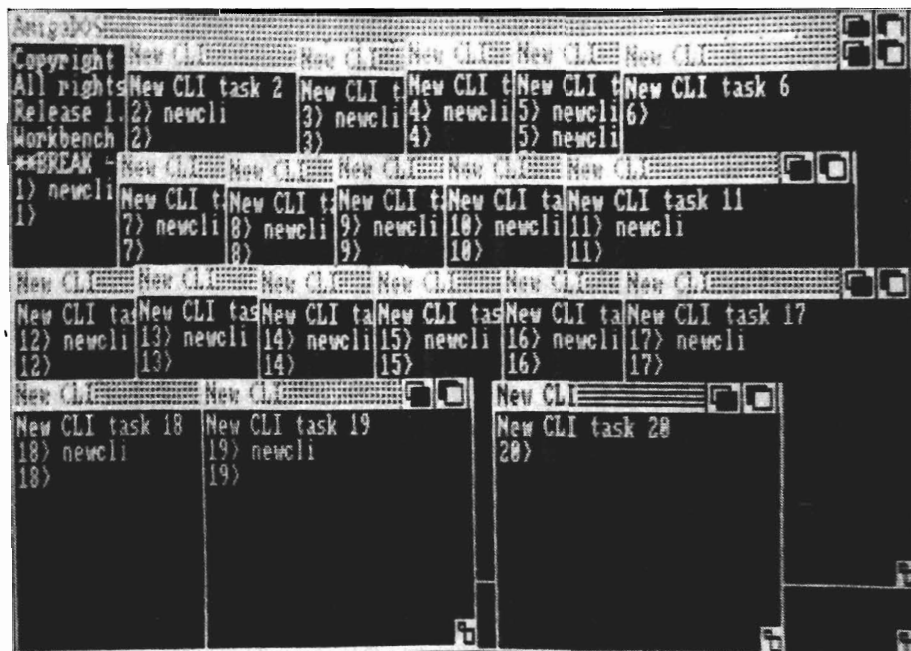
One common observation experienced users of "high-powered" computers speak of is that the disk drives on the Amiga seem "lazy" at first. On many machines, you give a disk command and the drive whirs immediately. The Amiga sometimes seems to think about what it is going to do before it does it.

Pour on the work however, and the Amiga begins to accomplish the most amazing things. That "thinking space" turns out to be rich with possibilities and, ultimately, efficiencies. You see, the Amiga reads and writes to the disk a *whole track* at a time. That's 11,264 characters at a time, so your appetite for data will have to get very large before the machine even starts breathing hard.

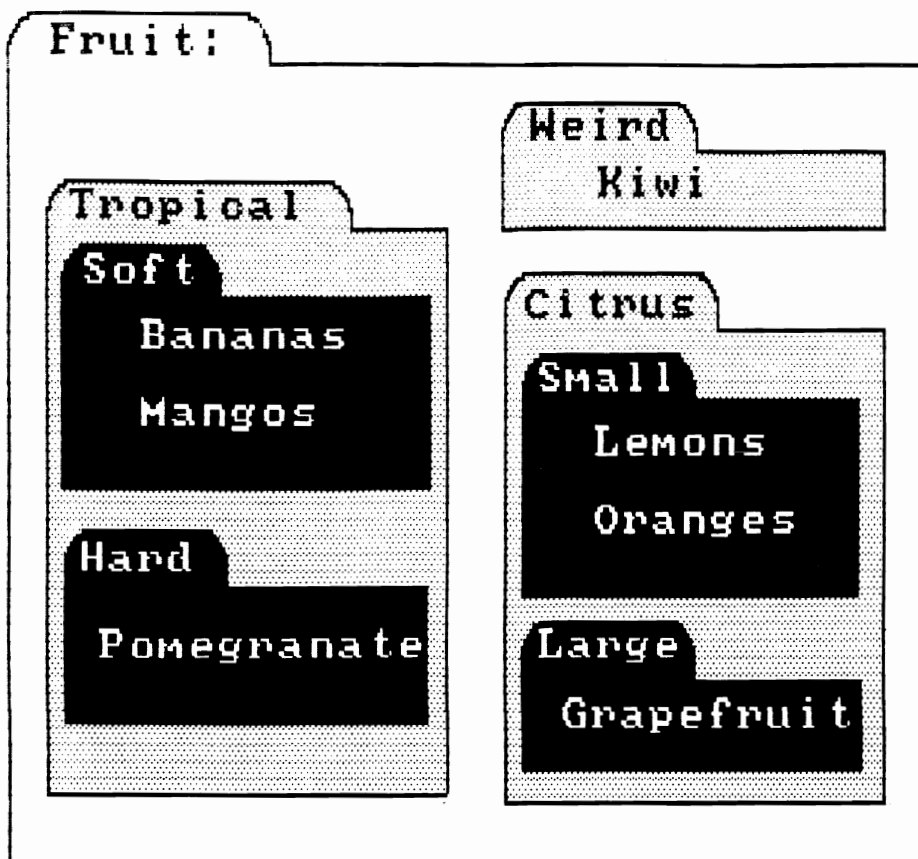
### Being in 2 (or 20) places at once

The following code will open a CLI window and set each of the eight directories (counting the root directory) we have created on our Fruit disk as the current directory for one of these windows.

```
1> CD Fruit ;Sets current directory
to the root directory.
1> NEWCLI ;Open new CLI window.
Opens new CLI window with "2>"
prompt.
2> CD Weird ;Sets current directory
for CLI 2 to Weird.
2> NEWCLI ;Open next window.
Opens new CLI window with "3>"
prompt.
```



**An Amiga screen with twenty Command Line Interface "terminals" open. There is a waiting cursor in each, although responsiveness slows noticeably in this extreme situation.**



### Filled Directories

3> CD :Citrus ;Must go back to root (: ) to locate Citrus, since it is not listed in Wierd.

3> NEWCLI ;Next window, please. Opens new CLI window with "4>" prompt.

4> CD Small ;Sets Small as current directory.

4> NEWCLI ;Repeat of process above.

5> CD /Large ;The slash "backs up" one level — Large is not in Small.

5> NEWCLI

6> CD :Tropical ;Back to the root to find Tropical.

6> NEWCLI

7> CD Soft ;Sets Soft as current directory for CLI 7.

7> NEWCLI

8> CD /Hard

At this point there are eight CLI "terminals" in operation, all of which are accessing the *same* disk. Each of these terminal windows has a cursor waiting in it, but the keyboard can only "talk" to one terminal at a time. You choose which terminal by clicking the

mouse cursor in its window. As a double check on where each window "stands" within the structure of disk, we could click on each window, in turn, and ask it for a directory with the DIR command.

```

1> DIR
    Weird (dir)
    Citrus (dir)
    Tropical (dir)
  
```

```

2> DIR
    Kiwi
  
```

```

3> DIR
    Small (dir)
    Large (dir)
  
```

```

4> DIR
    Lemons      Oranges
  
```

```

5> DIR
    Grapefruit
  
```

```

6> DIR
    Soft (dir)
    Hard (dir)
  
```

```

7> DIR
    Bananas      Mangos
  
```

```

8> DIR
    Pomegranate
  
```

In this setting, all this may seem a bit silly, but consider the potential. We could give a different job to each of these windows, and, if the tasks were large or we were fast typists, they could all be working at the same time! These terminals are all set to look at a different directory; even so, they can access any information on the disk. Using window 2, we could ...

2> TYPE Kiwi ;I.e., print the contents of the Kiwi file to the screen.

The meat of this small fruit looks like emerald green strawberries, but the skin is a hairy brown.

2> TYPE :Citrus/Small/Lemons

The Lemon is a small yellow fruit.

By giving window 2 a path name, it could, from where it is "standing" go back to the root directory and trace through the structure of the disk to find the file "Lemons". Basically, anything that can be done with CLI, can be done with any of these eight windows. Window 1 could be running a word processor, window 2 could be running a spread sheet, window 3 could be formatting a new disk, and on, and on. At least until you run out of memory, that is.

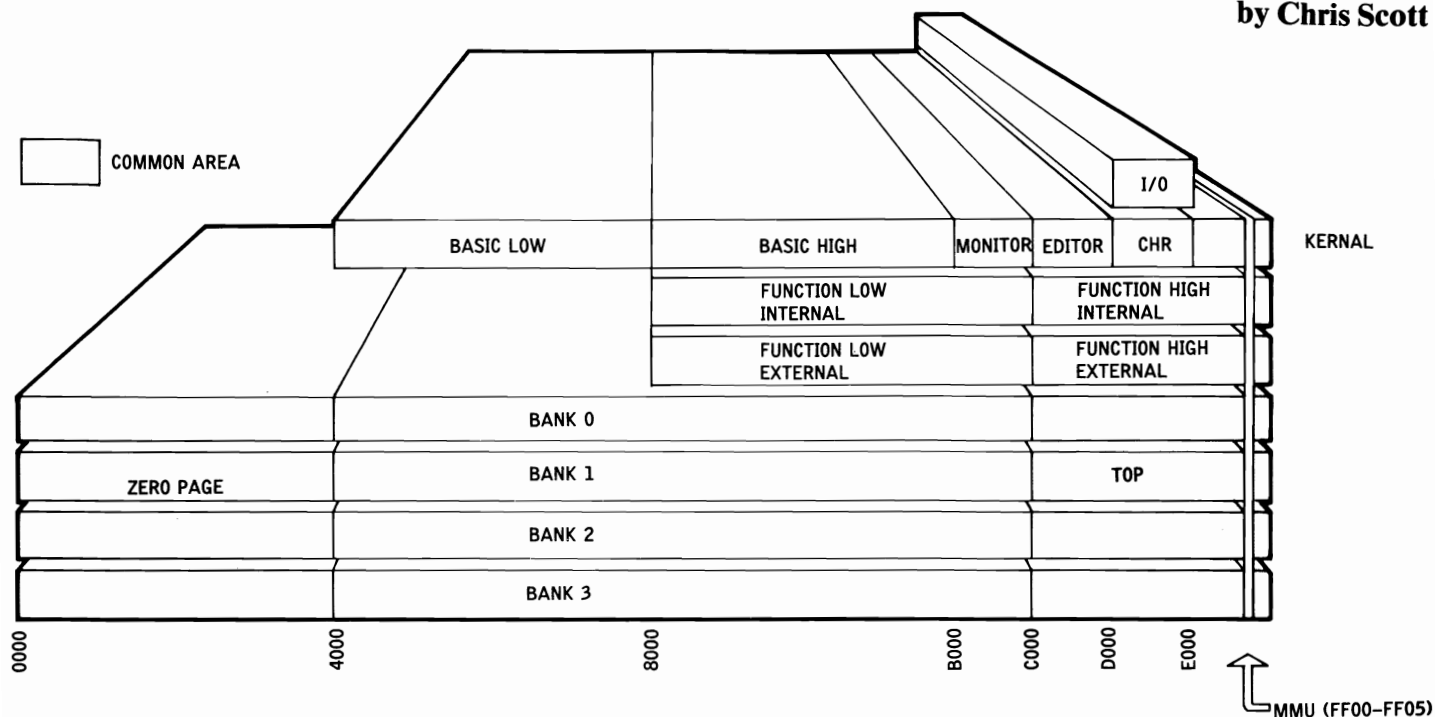
### Wild imagination

Go ahead, let your imagination run wild. Most of what you think might be possible *is* possible. Within the limits of memory, any of these windows can get information from anywhere in the system, do anything with it and put it anywhere else. With the Command Line Interface, the ball is nearly always in your end of the court. Care to serve?



# Memory Map Pictorial 128

by Chris Scott



Hello, again! Back to the 128 memory. The MMU is a hardware toggle. What that means, is the MMU will configure the RAM/ROM to what has been placed in the appropriate memory location between \$FF00 (65280) and \$FF04 (65284). This last part will be visual because I will be illustrating what are the different parts that make up the various configurations.

Location \$FF00 (65280) is the most important. Loading the accumulator with a number and depositing it in this location decides what Bank you are operating in. Bank 15 is the most convenient, because I/O is available. LDA #0: STA \$FF00=Bank 15.

This information should be sufficient for anyone determined enough to make the best use of all the available memory. I haven't prepared you for all the pitfalls you will run into, but the best offense is knowledge, and I hope I have added to your arsenal. So, for all you ROM/RAMBos out there ... "Good luck on your mission. If you should be ...".

BIT(S)	DESCRIPTION
0	What you put into this bit will determine what is accessed at location \$D000 (53248) to \$DFFF (57343). 0=I/O. 1=RAM/ROM, corresponding to bits 4 and 5.
1	This bit selects for memory range \$4000 (16384) to \$7FFF (32767). 0=BASIC (Low ROM). 1=RAM, corresponds to bits 6 and 7.
2,3	Selects for memory range \$8000 (32768) to \$BFFF (49151). 00=BASIC (High ROM). 01=Internal ROM (EPROM). 10=External ROM (Cartridge). 11=RAM, corresponds to bits 6 and 7.
4,5	These bits select for memory range \$C000 (49152) to \$FFFF (65535). 00=ROM (Kernal). 01=Internal ROM (EPROM). 10=External ROM (Cartridge). 11=RAM, corresponds to bits 6 and 7.
6,7	If no RAM is added, then 10 means the same as 00 and 11 the same as 01. These two bits select the RAM Bank.



# More Computer Magic

## Amazing Animals

by John Olsen

This month's magic trick is one of my favorites. It is a very colorful trick and most confounding. You will find that your friends will try it again and again, without a clue as to how it can work! This magic trick is called **Amazing Animals**, and I think you'll agree that the effect is truly amazing.

In the trick you are presented with a menagerie of twenty animals, ranging from birds to fish to snakes to the ever-popular skunk. Each is paired with another animal, in a somewhat bizarre version of Noah's Ark. You might find a horse paired with a llama, or a shark paired with a mouse. All are displayed on the screen in a variety of brilliant colors.

You are asked to choose mentally one of the ten pairs of animals. The computer then mixes the names of the animals and lays them out in four rows. It asks you if you see any of your chosen animals in the first row, second row, third row, and fourth row. Then from your answers to these four questions, the computer divines which two you were thinking of.

Usually after trying this trick several times, one person in the crowd will try to explain how it works. But this trick won't be so easy to explain. When you run the program, you answer only four "yes/no" questions. You may find the computer "know-it-all" will tell you that the secret is in the binary interpretation of your answers.

But if you press him further, he will admit that a binary number with four digits can describe only sixteen different values, which is not enough to describe twenty animals. You should also remind him that the twenty animals are being paired together, making ninety possible combinations! Let him try to explain that!

Could it have something to do with the colors? The computer "know-it-all" may jump on this possibility, explaining that since there are only ten colors the trick depends on them. But this can easily be disproved when you point out that pairs of animals rarely share the same color, and each animal's color changes each time the trick is played.

So what is the secret? How can the computer discover the pair of animals you picked when you did

no more than answer four questions with "yes/no" answers? The secret will be revealed in the following paragraphs. If you prefer to enjoy the magic without knowing the secret, finish reading this paragraph and then stop. The rest of this article will describe the basis of the trick, and the misdirection used to make it more puzzling.

As usual, the secret really isn't that hard to understand, once you know what it is. And if this trick were presented in its simplest form, it wouldn't fool very many people. Misdirection has always been the tool that magicians use to make a simple puzzle into a superb feat of magic. Misdirection is used here for exactly the same purpose. So in order to expose the trick, let's strip away all of the misdirection, and present the trick in its simplest form.

Imagine that you were asked to think of a number between one and ten. Then you were shown the chart below, and asked if your number appeared on any given row.

1	1	2	3	4
2	5	5	6	7
3	6	8	8	9
4	7	9	10	10

It should be obvious that if you say "Yes, I see my number" for only the first row, you must be thinking of the number one. And if you say "yes" to the first and second row, you are thinking of the two. The three is in the first and third row. The four is in the first and fourth row. The five is in only the second row. The six is in the second and third row. And this continues until you see that the ten is in only the fourth row.

This is the basis of the trick. You can see that in this simple form, it is not a very good trick. Most people would figure it out on the first try. That is where the misdirection comes in. We start by replacing the numbers with animal names. Instead of the two one's, we might write "horse" and "shark". And in place of the two's, we might write "tiger" and "stork". The rest of the numbers could similarly be replaced. These pairs of names could be placed on a sheet of paper, and the person could be asked to pick a pair of animals instead of a number from one to ten.

Although this would be a better trick, it still has some weaknesses. It would not take anyone too long to figure out what is going on. But suppose that you could rearrange both lists each time you demonstrate the trick. This means that if the person picks the same pair of animals each time, they will have a different "value". Instead of the "horse" and "shark" always having a value of "one", and always being found in the first row, they would move around to different positions. This is what the computer program has done.

But the program goes farther. It rearranges the order of the animals on the first screen. It also pairs up different animals each time. It also rearranges the four rows on the second screen, so that the "1 1 2 3 4" row may not be the first row after all. Luckily, the computer is very good at keeping track of all these things, and not getting confused like a human might.

Color makes the program visually more appealing. It also adds to the misdirection. If people wonder about the colors having something to do with the secret, they will spend less time wondering about the actual method. To keep this part as confusing as possible, the computer assigns different colors each time the program is run.

When you put this all together, you get a trick that is quite difficult to pierce. Each time, the animals are paired with different animals. Their order on the selection screen is different. Their colors are different. Their order on the question screen is also different. This means that if you constantly choose the third pair in the second column, you will get different pairings, different colors, and you will find them in different positions on the question screen.

Now, let's take a quick look at the program listing to see how all this fits together. Throughout the program, you will see several nearly identical routines. These are used to mix names, pairs, colors, or positions at random. I have used a simple "shuffling" routine, which I originally created to shuffle a deck of cards.

In the original version, it created 52 empty mailboxes. A random number was chosen and the corresponding mailbox was checked. If it was empty, the top card was inserted. If it was full, the mailbox below it was checked. If it was also full, the next one was checked, and so on until an empty one was found. This continued through the loop until the end of the deck was reached.

This method is much faster than the usual one in which a full mailbox triggers another random search until an empty one is found. In this program, the routine was modified for ten colors, twenty names, twenty positions, and four rows.

The "shuffle" routine is first seen in lines 40-70 where the 20 positions are mixed up. The routine is seen again in lines 80-110 where the 20 names are mix-

ed. The routine appears again in lines 149-170 to mix the colors at random. And finally the routine appears at lines 380-410 where the four lines of names are shuffled, and the five names in each line are also mixed.

When the program starts, the names, colors, and positions are put into arrays. Then the selection screen is printed starting at line 190. Since the colors will change each time the program is run, the usual way of printing colors could not be used. Instead of printing a color code inside the quotation marks, a poke was made to location 646, which determines the cursor color. In this way, the colors could be put in a numerical array and poked into location 646 when needed.

After printing the selection screen, the computer waits at line 350 for a key to be pressed. The WAIT command is used here, instead of the more common "GET AS" type command. It uses less memory, is faster to type, and doesn't waste strings and lead to string garbage collection.

When a key is pressed, the computer continues by shuffling the names. Since the computer can do this so rapidly, a "fake shuffle" occurs. The computer spends a few seconds blinking some colored lights, to leave the impression that it is really mixing the names well. This is just more misdirection.

In lines 450-480, the question screen is printed. Again, notice the use of pokes to create the colors, instead of color codes inside the quotation marks. This permits the colors to be easily changed the next time the program is run. Then the four questions are asked in a loop starting at line 490.

Since the program expects only one or two "yes" responses, these will be saved in the variables X and Y. Lines 540 and 550 assign values to these variables, depending on which row was a "yes". If only one variable is used, the program knows that both names were on the same row. If more than two "yes"'s are given, the computer knows an error has been made and the message in line 570 is printed.

The answers are matched with the animals in line 630 and the answer is printed out. To add suspense and make the trick appear harder, the answer is not given immediately. The computer appears to think and concentrate. Then, gradually, the answer comes to it. At the bottom of the screen, the two animals and colors are printed, thus finishing the trick.

Once again, a simple puzzle has been turned into a complicated magical effect by the application of misdirection and the ability of the computer to keep track of a confusing number of "shuffles". I hope this encourages some of you readers to try your own hand at some computerized magic tricks. Good luck, and good magic!



# Amazing Animals Listing

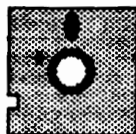
by John Olsen

```
1 rem * * * * *
2 rem *
3 rem * (c) 1986 john olsen *
4 rem *
5 rem * * * * *
10 dima$(20),a(20),p(20),r(10),t(4,4)
20 poke53280,0:poke53281,0
30 print"[clr][yel][ctrl-n][ctrl-h]Amazi
ng Animals by John Olsen"
40 forx=1to19step2:r=int(rnd(0)*10)+1
50 ifr(r)=0thenr(r)=x:nextx:goto80
60 r=r+1:ifr>10thenr=1
70 goto50
80 forx=1to20:r=int(rnd(0)*20)+1
90 ifa$(r)=""thenreada$(r):nextx:goto140
100 r=r+1:ifr>20thenr=1
110 goto90
120 dataeagle,goose,raven,tiger,camel,ze
bra,stork,horse,quail,sloth
130 dataskunk,sheep,squid,whale,mouse,co
bra,trout,shark,llama,hyena
140 forx=1to10:r=2*int(rnd(0)*10)+1
150 ifa(r)=0thenreada(r):a(21-r)=a(r):ne
xtx:goto190
160 r=r+2:ifr>20thenr=2
170 goto150
180 data2,3,4,5,6,7,8,10,13,14
190 forx=1to9step2
200 poke646,a(r(x)):print"[cmdr-o][cmdr-
o][cmdr-o][cmdr-o][cmdr-o]";
210 poke646,a(r(x)+1):print"[cmdr-o][cmd
r-o][cmdr-o][cmdr-o][cmdr-o][cmdr-o]";
220 poke646,a(r(x+1)):print"[cmdr-o][cmd
r-o][cmdr-o][cmdr-o][cmdr-o][cmdr-o]";
230 poke646,a(r(x+1)+1):print"[cmdr-o][c
mdr-o][cmdr-o][cmdr-o][cmdr-o][cmdr-o]";
240 poke646,a(r(x)):print"[rvs on] "a$(r
(x))" [rvs off] ";
250 poke646,a(r(x)+1):print"[rvs on] "a$
(r(x)+1)" [rvs off] ";
260 poke646,a(r(x+1)):print"[rvs on] "a$
(r(x+1))" [rvs off] ";
270 poke646,a(r(x+1)+1):print"[rvs on] "
a$(r(x+1)+1)" [rvs off] ";
280 poke646,a(r(x)):print"[cmdr-u][cmdr-
u][cmdr-u][cmdr-u][cmdr-u][cmdr-u]";
290 poke646,a(r(x)+1):print"[cmdr-u][cmd
r-u][cmdr-u][cmdr-u][cmdr-u][cmdr-u]";
300 poke646,a(r(x+1)):print"[cmdr-u][cmd
r-u][cmdr-u][cmdr-u][cmdr-u][cmdr-u]";
310 poke646,a(r(x+1)+1):print"[cmdr-u][c
mdr-u][cmdr-u][cmdr-u][cmdr-u][cmdr-u]";
320 print"[grn] Above are ten pairs of
animal names."
330 print" Mentally pick one pair of
names."
340 printtab(8)"Press a key to continue."
350 wait197,64:wait197,64,255
360 print"[clr][down][down][down][down]"
```

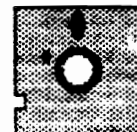
```
down][down][down][down][down][down][down]
]mixing the names"
370 forx=1to496:poke53280,xand15:next
380 fory=0to3:forx=1to5:r=int(rnd(0)*5)+
1+5*y
390 ifp(r)=0thenreadp(r):nextx,y:goto430
400 r=r+1:ifr>5*y+5thenr=5*y+1
410 goto390
420 data1,3,5,7,2,9,11,6,13,10,8,15,17,1
2,16,4,19,20,14,18
430 forx=1to4:fory=1to4:readt(x,y):nexty
:nextx
440 data1,5,7,3,5,9,11,13,7,11,15,17,3,1
3,17,19
450 print"[clr][down][down][down]":forx=
1to16step5
460 fory=0to4:poke646,a(p(x+y)):print"[c
mdr-o][cmdr-o][cmdr-o][cmdr-o][cmdr-o][c
mdr-o][cmdr-o]";:nexty
470 fory=0to4:poke646,a(p(x+y)):print"[r
vs on] "a$(p(x+y))" [rvs off] ";:nexty
480 fory=0to4:poke646,a(p(x+y)):print"[c
mdr-u][cmdr-u][cmdr-u][cmdr-u][cmdr-u][c
mdr-u][cmdr-u]";:nexty,x:print"[down][d
own]"
490 x=0:y=0:forz=1to4:print"[yel] Is
one of your animals in the"
500 reada$:printtab(14)a$ " row?":poke198
,0
510 datafirst,second,third,fourth
520 geta$:ifa$="n"then590
530 ifa$<>"y"then520
540 ifx=0thenx=z:goto590
550 ify=0theny=z:goto590
560 print"[up][up]";
570 print"[whl] You were supposed to be
thinking of"
580 print" two animals! Let's try it a
gain...":goto710
590 print"[up][up]";
600 print"
[up][up]":w=1:gosub720
610 nextz:ifx=0then570
620 ify=0theny=x
630 z=t(x,y):w=6:gosub720
640 printtab(6)"You were thinking of the
";
650 forx=1to3:w=4:gosub720:print".":nex
tx:print:w=5:gosub720
660 poke646,a(z)
670 printtab(9)"[cmdr-o][cmdr-o][cmdr-o]
[cmdr-o][cmdr-o][cmdr-o][cmdr-o][down][l
eft][left][left][left][left][left][left]
[rvs on] "a$(z)" [rvs off][down][left][l
eft][left][left][left][left][left][left]
[cmdr-u][cmdr-u][cmdr-u][cmdr-u][cmdr-u]
[cmdr-u][up]";
680 w=5:gosub720:print"[whl]and [up]";
690 w=7:gosub720:poke646,a(z+1)
700 printtab(9)"[cmdr-o][cmdr-o][cmdr-o]
[cmdr-o][cmdr-o][cmdr-o][cmdr-o][down][l
eft][left][left][left][left][left][left]
[rvs on] "a$(z+1)" [rvs off][down][left]
[left][left][left][left][left][left][cmd
r-u][cmdr-u][cmdr-u][cmdr-u][cmdr-u][cmd
r-u][cmdr-u]";
710 wait197,64:wait197,64,255:run
720 fort=1tow*130:nextt:return
```

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# Computer Curmudgeon

## Now You See It — Now You Don't: Vapor Ware Strikes Again

by **Mindy Skelton**

In the implacable march of time, in lives fraught with the Sturm und Drang of modern living, when frustration and helplessness threaten to overcome us, isn't it pleasant to reflect on some of the more concrete irritations of these decadent days rather than the overwhelming nameless dread? With this thought in mind, gentle readers, I offer you the solace of my current favorite irritation.

Imagine, if you will, the following scenario; a man (or woman . . . Heaven knows I'm not sexist, except perhaps in a reverse sort of way, but that's neither here nor there, so as I was saying, a man) goes into a car dealership and tells the salesman he wants to buy a Super Deluxe Hyper Galaxian Mysto Cruiser 2000XL. He's (or she's) seen the ads in magazines, and on T.V., is overwhelmed by the beauty, grace and style of this machine and can't live another moment without one.

Trying not to salivate in the man's face, the salesman whips out an order form, quickly writes up the order and as almost an aside, says "Oh, by the way, the car is not actually ready yet, but they're testing the prototypes next month and if everything goes well, you can expect delivery in six or seven months. Now if you just give me your check or credit card number for payment in full, I'll put you on the waiting list, and you'll be hearing from us."

The customer hands over his money and leaves smiling. Sound like science fiction? Waiting to hear Rod Serling's voice tell you you're in the Twilight Zone? Worse yet, dear reader, you're in the Vapor Ware Zone.

Yes, the Vapor Ware Zone; that foggy land of products that are advertised, and advertised, and promoed, and hyped, and ordered, and paid for, but don't seem to be able to make an actual appearance. Where but in the world of computerdom could *anyone* get away with this?

In the interest of absolute clarity, we should divide vapor ware into three different categories. The first kind never makes an appearance, eventually fades away and is never heard from again. The second kind makes an appearance, but in a radically altered form. The third category appears as advertised, just several months later.

Vapor ware is not a new phenomenon (but does seem to be gaining in popularity). Those of us who waited in vain for the MAX for the Commodore lap computer, or the dual drive version of the SX-64 (all category 1 items), know the exquisite sensation of excitement ("Wow! What a neat new thingie!") turning to mild annoyance ("Gee. It was supposed to be out by now.") to advanced irritation ("Another *how* many months?") to honest anger ("What do you mean the entire thing has been cancelled?!").

There is a long and illustrious history of non-appearance of hardware. And just because these glory days are past, don't feel you have been left out . . . go out and buy yourself a 1572.

Don't let me give you the wrong impression, vapor ware doesn't always fade off into the mist (note categories two and three). Quite the opposite. Most products really do reach the shelves. However, as an extreme example of the syndrome, consider the "Apple Emulator". Years ago, when I bought my first Commodore, the single thing I most wanted was the promised Apple Emulator (if you must know — there were some adventure games I wanted to be able to play). For weeks, dragging into months I listened to the mating cry of the spotted or garden variety vaporware disk . . . "About two more weeks . . . About two more weeks." Finally I gave up and moved on to other dreams.

Now, at long last (and long after I ceased to care), there are two products on the market (in much changed form from the original descriptions — see category two) that purport to allow Apple software to run on my C-64. Oh, it's true that one of them only runs Applesoft programs (and almost nothing is written in JUST Applesoft any more) and the other costs almost as much as the Apple itself, looks difficult (read impossible) to connect, and is only *slightly* harder to find than

plaid paint, but never mind, vapor ware often emerges into reality in surprising forms.

Now I hear the rumblings of the software shopper. Don't believe for one second that I am foolish enough to limit vapor ware to the realm of hardware. Ephemeral software also exists, or rather doesn't.

While once it seemed possible to purchase new software after seeing an ad (or did I just dream that along with bandstands, lemonade and children who curtsy?), it now seems that programs are more often than not advertised long before they ever become available.

The current crown of dishonor in this particular arena is held by an outfit which specializes in fantasy role playing adventures. They have been advertising the newest addition to one of their series for two years now and the program is *still* not on the market. [Maybe the adventure is to find the programmer and force him to finish the game?]

I don't know how things are where you come from, but I always thought that taking money for something that didn't exist was, at the very least, in bad taste. Now before every libel lawyer in the western hemisphere comes crashing down on me, let me assure you that I don't mean to insinuate that all, or even most, advertisements of vapor ware are fraudulent, but there are times where the line between con job and good intentions (you know, those things that pave the road to you-know-where) is very thin.

I know of one case where nearly a quarter of a million dollars was collected before even one copy of a certain product was shipped (and the ones that finally shipped didn't work quite as advertised). This is most likely an isolated incident, but it does alert the intelligent sort of reader who is likely to be reading this column, to the potential for abuse.

Very good. We've established what we all knew already ... vapor ware exists. Now what? All frivolity aside (you *have* noticed the frivolity haven't you?), my natural bent for justice, and cool, calm reason compel me to say that there are one or two legitimate reasons why a product might seem to be "vaporous".

Magazine deadlines often necessitate placing ads several months in advance. It is quite possible for a conscientious company to place an ad for a product that they, in good faith, plan to have on the market by the time the ad is published, only to find production or programming problems prevent timely presentation. I'm reasonable. I can understand and commiserate with such situations. But when ads run for months with no product, one begins to wonder. Testing the market for a product by advertising it, and seeing how many people are interested, does not strike me as quite cricket.

The situation is equally annoying for the purveyor of software. It's no fun for your corner software store to tell you (or the other 4,000,000 avidly hopeful buyers) day after day, "Sorry, Widget Wars still hasn't been released. Try again in a couple of weeks." And yet, no matter how annoyed they become, few stores feel free to cancel their orders because there are so many interested potential buyers. Nor can they comfortably stop advertising, because their distributor is promising *them* delivery in "a couple of weeks".


So where does this leave us? It seems to me that it leaves us with angry and frustrated customers and vendors, and with companies building unwarranted hard feelings for themselves. It seems a shame that so much ill will must be generated in pursuit of the dollar. Surely if a product is good enough, people will buy it, even without months of pre-advertisement.

Maybe if a few judicious letters were written to the "offending" companies letting them know of our frustration, or even if people (and I know this is a radical idea) *didn't* buy products that were vaporously advertised, we might see the end of this annoying phenomenon.



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## PASCAL'S TRIANGLE

by Carmen Artino

# Prime Numbers

A prime number is a positive integer that has no factors (divisors) other than itself and 1; any other integer is called a "composite" because it is composed of a product of prime numbers. Actually, the number 1 is usually excluded from both descriptions, being given some sort of singular status all its own.

Just as atoms can be considered as the building blocks of the material world, the prime numbers are considered to be the building blocks of the set of positive integers; in fact, a precise statement of this is called the Fundamental Theorem of Arithmetic: Every positive integer greater than 1 is either a prime number or is uniquely the product of prime numbers. Thus,  $90 = 2 \times 3 \times 3 \times 5$  and there is no other way to write 90 as a product of different prime numbers! This may seem to be obvious but there are number systems in which "prime" factorization is *not* unique!

The first few prime numbers can be easily written down: 2, 3, 5, 7, 11 ... But how many of them are there? Are they regularly disbursed throughout the set of positive integers? Do they have any special properties? Is there an easy way to generate them without checking each integer? What good are prime numbers, anyway?

The answer to the first question is relatively easy for us to understand today because Euclid (c. 300 BC) wrote the answer down some 2100 years ago; namely, there are an infinite number of primes.

Euclid established this fact by supposing that there is a finite number of them, then showing that this assumption leads to a contradiction. It's a fairly simple argument and goes something like this.

Suppose there is a finite number of primes. Then we can multiply them all together to get a number, call it  $p$  (for product, I guess). Add 1 to  $p$  and we have a new number,  $p + 1$ . Now let's take a look at  $p + 1$ .

It can't be a prime, we've accounted for all of those (keep in mind our supposition); not only that, it's clearly bigger than all our primes. In fact, it is 1 bigger than the product of all our primes. Therefore, it must be a composite number. Being such, it must have a prime divisor, say  $q$ .

Now, since  $q$  is a divisor of  $p + 1$  and a divisor of  $p$  (remember that  $p$  is the product of *all* the primes), it must also divide 1 and this is a contradiction — *nothing* divides 1 except 1. Thus, the supposition that there is a finite number of primes must be false.

The only other alternative is that there are infinitely many prime numbers! Isn't that a neat argument! And to think it was given by Euclid over 2000 years ago! There are many other arguments showing the infinitude of the primes, but one is enough.

What about the next question? Are the primes regularly disbursed throughout the set of positive integers? An attempt to answer this question has led to some very interesting questions in Number Theory, that branch of mathematics of which this discussion is a part.

Some of these questions are still unresolved today! Let's look at the sequence of prime numbers: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47 ... There doesn't seem to be a regular pattern to this sequence so the answer to the question must be *NO*. However, we will profit by taking a closer look.

First, let me remark that there is a rather simple argument which, in effect, says that there are arbitrarily large gaps in the sequence of prime numbers. This means that if someone gives me a number (a positive integer), I can produce a sequence of *consecutive* positive integers, none of which is a prime! For example, if given 100, I can produce 100 consecutive positive composite integers!



This, of course, means that the gap between one prime and the next can be as large as we like. This does not say that the gap can be produced where we please, it just says that one will always exist.

Try it, say, for 10. That is, try to produce 10 consecutive composites (one such list begins with 39,916,802 and ends with 39,916,811. There is a gap of length 33 starting at 1328 and ending at 1360; that is, the sequence 1328, 1329, 1330 ... 1360 are all composite integers. Thus 1327 and 1361 are *consecutive* prime numbers!)

There is, however, a gap of even greater interest; namely, a gap of length 1. Look at the pairs 3, 5 or 5, 7 or 11, 13 or 17, 19 or 41, 43, or ... Such pairs of prime numbers are called TWIN primes and there appears to be an awful lot of them! However, no one has ever been able to show that there are an infinite number of such pairs even though some of the greatest mathematical minds of the 19th and 20th centuries have tried!

It appears from some known facts that twins occur independently; that is, the occurrence of one pair is not affected by the occurrence of the previous pairs. Other questions concerning twins have lead to certain rather difficult results.

The most famous of these is a result of Peter Gustav Dirichlet (1805-1859) (pronounced DIR-ish-LAY). He was able to show that an infinite number of primes always occurs in any arithmetic progression so long as some simple conditions are met! (Recall that an arithmetic progression is just any regular sequence of integers like 2, 4, 6, 8 ... or 10, 13, 16, 19 ... or 1, 5, 9, 13, 17 ...).

Carl F. Gauss, one of Dirichlet's mentors and most probably one of the greatest minds in history, approached the problem of the distribution of the prime numbers somewhat differently. He worked with the number of primes that are less than or equal to a given integer  $n$  and called this number  $\uparrow 1(n)$ ; that is,  $\uparrow 1(n)$  = the number of primes  $\leq$  to  $n$ . For example,  $\uparrow 1(10) = 4$  because there are four primes less than or equal to 10.

Gauss was able to show that as  $n$  gets larger and larger, the ratio of  $\uparrow 1(n)$  to  $n$ ; i.e.,  $\uparrow 1(n)/n$ , gets smaller and smaller. This means that number  $\uparrow 1(n)$  remains relatively the same as the values of  $n$  get larger. Put another way,  $\uparrow 1(n)$  grows *very slowly*! He also conjectured that its rate of growth was about the same as the number  $n/\log(n)$  (that's the same log that the BASIC in your Commodore 64 has). The conjecture was proved (independently by Jacques Hadamard and Charles-Jean de la Vallee Poussin) in 1896 and is now known as The Prime Number Theorem.

It is interesting to note that Gauss made this conjecture when he was about 14 years old (c. 1791) and it took mathematicians about 100 years to establish the result!

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Regarding prime numbers with special properties, I would like to discuss two types. Both types are named after friends of Pascal, Mersenne and Fermat. Let's talk about Mersenne primes or, rather, Mersenne numbers first.

These all have the form  $2^n - 1$ , and I will refer to them, as is common practice, as  $M_n$ . We note that in order for  $M_n$  to be a prime,  $n$  itself must be a prime number; that is, if  $M_n$  is prime, then  $n$  is a prime also. Be careful! Don't interpret this as saying that if  $n$  is prime, then  $M_n$  will be also. This is not true as  $2 \mid 11 \mid -1 = 23 \times 89$  shows. It just says that if you want to check whether  $M_n$  is prime or not, just check them when  $n$ , itself, is a prime.

Mersenne numbers got their name because Father Mersenne made a conjecture about them that stood up for a long time; his interest in numbers of this form stemmed from their connection to another type of integer called a perfect number. They don't concern us here; suffice it to say that an even perfect number always has two factors, a power of 2 and a Mersenne prime. (Perhaps I should discuss them in another column.)

The conjecture that Mersenne made concerned the primality of  $M_n$  for certain values of  $n$ . He has since been proved wrong, but the form he used,  $M_n = 2^n - 1$ , is the one most used today in the search for large prime numbers. Mersenne conjectured that  $M_n$  is prime when  $n = 2, 3, 5, 7, 13, 17, 19, 31, 67, 127, 257$ , and that  $M_n$  is composite for all other primes less than 257.

He could not test the primality of all the numbers he announced; the techniques of his time (17th century) were not capable of handling such large numbers. The complete check of Mersenne's conjecture was completed in 1947 with aid of desk calculators (what monsters they were in those days).

Mersenne made only five mistakes!  $M \mid 67 \mid$  and  $M \mid 257 \mid$  are not prime while  $M \mid 61 \mid$ ,  $M \mid 89 \mid$ , and  $M \mid 107 \mid$  are. Since then, better and better algorithms and programming techniques have lead to the search for bigger and bigger primes. Since Mersenne's form is so simple (and for certain other reasons), primality of this type of number is the one most often checked.

In 1968,  $M \mid 11213 \mid$  was shown to be prime at the University of Illinois. Officials there were so proud of this fact that it was celebrated on their postmark! (Urbana, Illinois, January 17, 1968).

In 1978, two high school students in California, Laura Nickel and Curt Noll, used about 440 hours on a large computer to show that  $M \mid 21701 \mid$  is prime. By 1982,  $M \mid 44497 \mid$  was known to be prime. More recently, D. Slowinski showed that  $M \mid 86243 \mid$  and  $M \mid 132049 \mid$  are prime, the latter being the largest known prime as of this writing. This number has 39751 digits! What is not known is whether there are

an infinite number of primes of Mersenne's form; the answer is most likely yes but no one knows for sure.

The Fermat numbers have the form  $2^n + 1$  where  $n = 2^m$ . I shall refer to them as  $F_m$ . The interest in numbers of this type come from two sources. First, Fermat, himself, thought that all Fermat numbers were prime because he was able to observe that  $F_0 = 3$ ,  $F_1 = 5$ ,  $F_2 = 17$ ,  $F_3 = 257$ , and  $F_4 = 65537$  were all prime. He could not, however, come up with a proof.

That matter was settled in 1742 when Euler (say OI-ler) showed that  $F_5 = 4,294,967,297$  had 641 as a factor and was therefore *not* prime. It is now known that  $F_m$  is not prime for  $m$  between 5 and 13 and for 47 other values of  $m$ . The largest of these is  $m = 1947$ .

The best guess at this point is that  $F_m$  is not prime for  $m > 4$ . Second, and more importantly, the interest in Fermat primes stems from the discovery by Gauss of their connection to a rather ancient problem of geometry. The problem is to determine all regular polygons (a many-sided plane figure) that can be constructed using only a ruler and a compass. The ruler is used only to draw straight lines, no measurement is implied, and the compass is used only to draw arcs.

Regular means that the sides of the figure are all equal as well as its angles. For example a square is a regular polygon (a 4-gon) but a general rectangle is not. The Pentagon building in Washington, DC is an example of how a regular 5-gon can be used in architecture.

Gauss discovered that a circle could be divided into 17 (a Fermat prime) equal parts using only the tools mentioned and that if it was desired to construct other regular  $n$ -gons, then  $n$  had to be either a power of 2 or a power of 2 times a product of Fermat primes! He was so proud of this discovery that he requested that a regular 17-gon be inscribed on his tombstone (for what ever reason, his request was never granted).

The discovery also lead to his decision to become a mathematician instead of a philologist (one who is interested in historical linguistics), an interesting decision for a lad of 19!

There are many other problems associated with prime numbers, some as yet unsolved. Probably the easiest of these to understand is the Goldbach's Conjecture. In a letter to Euler in 1742, Christian Goldbach conjectured that every even integer is the sum of two numbers that are either primes or 1.

The general formulation of Goldbach's Conjecture used today is that every even integer greater than 4 can be written as the sum of two odd prime numbers. For example,  $6 = 3 + 3$ ,  $8 = 5 + 3$ ,  $10 = 7 + 3$  or  $= 5 + 5$ ,  $12 = 7 + 5$ , etc. The preponderance of evidence seems to suggest that the conjecture is true, yet no one has ever come up with a proof or a counterexample!

Generating prime numbers is not too difficult so long as we don't want to generate *too* many (then it would take too long). I have supplied two programs, written in Pascal, of course, for doing this. The first uses direct division and the fact that if an integer has a divisor less than its square root, it must also have one greater than it.

The important part of this program is contained in the Boolean function `prime`. This function returns TRUE if its argument is a prime and FALSE otherwise.

The second program is an implementation of the famous Sieve of Eratosthenes. To understand how the sieve works, write down the integers from 2 to 100. Next, cross out the multiples of 2 starting with 4. Then cross out the multiples of 3 starting with 6. Proceed next with the smallest integer in the list that hasn't been crossed out; that would be 5, etc.

Stop when no more integers in the list can be crossed out. The numbers that are left will be the primes between 1 and 100. The important part of this program is the WHILE loop. I have also included in each program, timing statements so the time to find the primes in the two programs can be compared. It is remarkable how much faster the Sieve method runs.

## The Programs:

### 1. The primes by direct division:

```
PROGRAM testprime(INPUT,OUTPUT);

CONST max=500;
VAR n,i,time:INTEGER;
    primelist:ARRAY[1..max] OF INTEGER;

FUNCTION prime(m:INTEGER):BOOLEAN;
VAR i,max:INTEGER;
BEGIN
    prime := TRUE;
    max := TRUNC(SQRT(m));
    i := 3;
    WHILE i <= max DO
        BEGIN
            IF m MOD i = 0 THEN prime := FALSE;
            i := i + 1
        END
    END;
END;

BEGIN
    PAGE;FOR i:=1 TO max DO primelist[i] :
= 0;
    WRITELN('A list of the primes between
1 and',max:5);
    WRITE(2:3);
    n := 3; i := 1;
    SETTIME(00,00,00); (* An Oxford Pascal
function. *)
    WHILE n <= max DO
        BEGIN
            IF prime(n)=TRUE THEN
                BEGIN
                    i :=i + 1;
                    primelist[i] := n
                END;
            n := n + 2
        END;
END;
```

(\* HOURS, MINUTES, SECONDS are Oxford Pascal functions. \*)

```
    time := 360 * HOURS + 60 * MINUTES + S
ECONDS;
    FOR i := 1 TO max DO IF primelist[i] <
> 0 THEN WRITE(primelist[i]:5);
    WRITELN('It took',time:4,' sec
onds.')
```

### 2. The Sieve of Eratosthenes:

```
PROGRAM eratosthenes(INPUT,OUTPUT);

CONST max = 500;
VAR i,j,n,limit,time:INTEGER;
    sieve:ARRAY[1..max] OF INTEGER;

BEGIN
    PAGE;sieve[1] := 0;WRITELN('A list of
the primes from 0 to',max:5,':');
    FOR i := 2 TO max DO sieve[i] := i; (*
initialize sieve *)
    SETTIME(00,00,00);
    limit := TRUNC(SQRT(max));
    FOR i := 2 TO limit DO
        BEGIN
            j := i;
            WHILE i*j <= max DO
                BEGIN
                    n := i*j;
                    IF sieve[n] <> 0 THEN sieve[n]
:= 0; (* cross out *)
                    j := j + 1
                END
            END;
            time := 360 * HOURS + 60 * MINUTES + S
ECONDS;
            FOR i := 1 TO max DO IF sieve[i] <> 0 T
HEN WRITE(sieve[i]:5);
            WRITELN('It took:',tim
e:4,' seconds.')
```

The programs find the primes between 1 and 100. If another range is desired, change the CONST max at the beginning of each program. Note the time differential of each program when 100 is changed to 500 or 1000. Also, the dimension of `primelist` in the first program is way too big, especially for large values of max. You can save space by cutting down the size of the array.

The author welcomes comments and suggestions concerning this column. The interested reader may write to the author at P.O. Box 43, Guilderland, NY 12084.

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# The Tube:

## How the picture gets there.

by Grant Johnson

There can scarcely be anyone who hasn't been exposed. Most of us have spent more time looking at them than we would care to admit, and they have fundamentally changed our lives for better or otherwise. But how many of us really know much about the "picture tube"?

The television has become the quintessential consumer product. It seems that every town large enough to have a church has a row of sets on sale somewhere. We may pause to consider some cable-ready or remote-control feature, but for the most part, the claims of "clean beam scrubbers" and "color finding fulminators" seem little more than patent-medicine hype.

We look for a good picture, and then, if it has a box around it we can live with, we take it home. Life is not necessarily so simple for computer owners, however. You can get by, of course, with a TV for 40-column display, but if you want a clear picture, or one that's even usable at all with 80-column display, you must deal with some kind of monitor.

Most stores will sell you a monitor that will work with the computer you have, but that's a lot like ordering a "cooking device" for your kitchen and hoping that you will get a nice range and not a hot-plate. Just spending a lot of money is no guarantee, either. You will be eating a lot of cold dinners if you try to plug a gas range into an electrical outlet.

As a remedy for those of you in the dark, we offer this two-part series on The Tube. This month we will bring you up to speed on the essentials of how the display tube works, and next month we'll put computer and display together.

### Armchair Physics

To understand how the tube works you must review some basic physics. Some of you develop a rash at the mere mention of force triangle. Don't panic. We try hard to speak English in this magazine, and I promise that you will understand what is said. Remember, even sub-atomic specialists are still arguing about precisely *what* an electron is. We will stick to "armchair physics" and will include only an occasional number where it might be of interest.

Actually, we can get along quite well without even knowing what electrons are. I once had a teacher who presented to her class a small box containing an object. As she answered questions about the weight of the box, shook it and tipped it from side to side, we were encouraged to guess about its contents. When the box was tipped one way the object would slide; when tipped in the other direction, the object would roll.

The speculation became quite heated until we finally agreed that the object was most probably a pencil. Having reached this conclusion, we all waited expectantly for the box to be opened. Instead,

the teacher put the box away. To quiet our protests, she explained that she had been through the same exercise many years before, and that she had been told that if the box were opened, the lesson would be forgotten. She said she had never forgotten. Neither have I.

It doesn't really matter that I never saw the pencil in that box. When it comes to practical matters, if it always behaves as a pencil does, then it can be treated like a pencil. Likewise, the electron.

### Some history

The electron has yet to be seen, but its behavior has become fairly well known. The investigators that discovered its properties used a glass tube rather than a box, but the method was much the same. The object of interest was manipulated in various fashions and its behavior was observed.

Actually the test tube might be a better place to pick up the story, for it was a British scientist, Michael Faraday, who noticed that chemical changes could be caused by passing electricity through water solutions of chemical compounds. Matter was electrical in nature, it was concluded, and, some forty years later, G. J. Stoney proposed the existence of particles of electricity he called electrons.

Near the turn of the century, investigation turned to the flow of electric current through a gas discharge tube. This was simply a glass envelope with a piece of



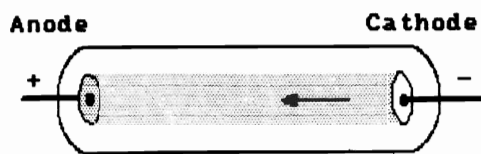
metal (electrode) sealed into each end. **Figure 1** depicts such a tube. Crank up the voltage, and you could see thin sparks (lightning in a bottle). Things really got interesting as the pressure of gas in the bottle was reduced. The sparks broadened into a luminous glow (like the glow of the northern lights, which is caused by charged particles from the sun streaming through the rarified upper atmosphere).

This was clearly “sexy” science, and, as vacuum pumps improved, it seems everybody wanted to study discharge tubes. It was found that air glowed red, hydrogen produced a blue glow, and neon a bright orange-red one (and you know what that led to). All kinds of things were tried with this arrangement. A pinwheel was placed between the electrodes, and whatever it was that flowed from the cathode to the anode would set it spinning. At the time, the flow was being called a cathode ray, since it came from the cathode (negative) end of the tube.

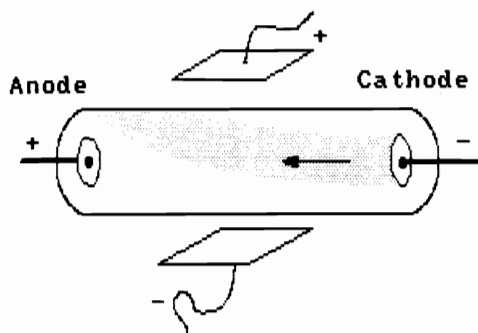
It was found that these rays could heat a piece of foil placed in its path. Cathode rays were found to cast shadows, and normally (we’ll get to exceptions shortly) to travel in straight lines. It didn’t matter at all what you made the electrodes out of or what kind of gas was in the tube.

Sir William Crookes got it right when he decided that these rays were in fact tiny electrically charged particles so small as to be “as far removed from the state of a gas as a gas is removed from a liquid.” The electron turns out to be the poor man’s sub-atomic particle. You don’t need a billion dollar accelerator to produce them, and we use them all the time in everyday life.

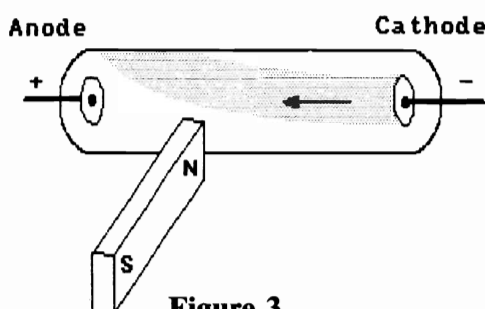
Several other observations were made that are important to where we are headed. It was found that if you place a screen coated with zinc sulfide phosphor bet-



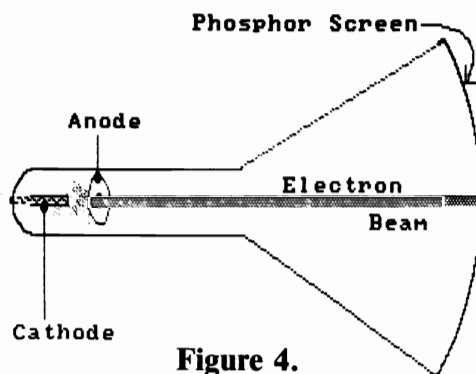
**Figure 1.**



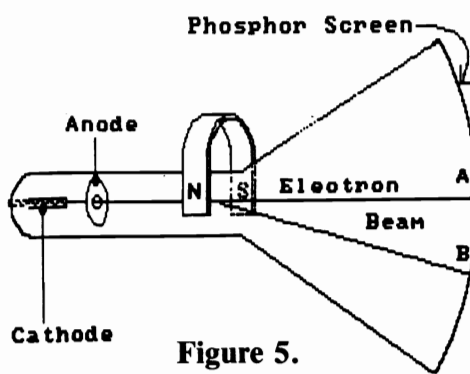
**Figure 2.**



**Figure 3.**



**Figure 4.**



**Figure 5.**

ween the electrodes, the phosphor would glow on the side toward the cathode. Although the cathode rays travel in straight lines, you could bend them with either an electrical field (**Figure 2.**) or a magnetic field (**Figure 3.**)

As the vacuum in the tube was increased, the ability of the gas within the tube to conduct a flow of electrons first increased then decreased to the point where no glow could be seen. But the flow was still there, and, if you increased the voltage enough, the glass in the anode end of the tube could be made to fluoresce.

Some terms: When an object is heated enough to emit light, it is said to be incandescent. If it can be made to emit light without being heated, it is said to be luminescent. There are two kinds of luminescence. If the light doesn’t persist for long (more than a few hundred millionths of a second), it is fluorescent. Light that persists for a longer period (sometimes minutes or even hours) is said to be phosphorescent. Precisely why light emission is prolonged in phosphorescent materials is not fully understood. I will not tempt the Nobel committee with a full explanation here.

These properties were employed in a further development of the tube. The new configuration was called a cathode ray tube and consisted, basically, of a glass bottle with a phosphor coating in the bottom. The cathode was placed where a cork would be, and the anode was placed in the neck of the bottle. This anode, however, had a hole in its center through which some of the electron “rays” could pass and go on to strike the phosphor screen, as illustrated in **Figure 4.**

Modern physicists have shown, at least mathematically, that magnetism and electricity are, at a fundamental level, related. Once you know how the game is played, you can, for example, con-

vert magnetism to electricity in a generator, and electricity to magnetic force in a motor.

The next step by investigators was to affect the straight path of the electronic beam with magnets and electronically charged plates. In **Figure 5**, you can see that the unaffected beam would strike the phosphor screen at point "A", but the application of a magnetic force diverts it to point "B". The same thing could be accomplished with charged plates instead of magnetism. In fact, both of these forces were used simultaneously. By balancing a measurable magnetic force against a measurable electronic one (thus returning the beam to point "A"), J. J. Thomson was able to measure the ratio of an electron's mass to its charge. This ratio indicated that either an electron was very small or that it had an enormous charge. It was *very* small. It takes, roughly, 497,911,113,500,000,000,000,000,000 of the little devils to make a pound. Got that? (There will be a test on this important information later.)

The most familiar example of energy potential is that due to gravity. Place a marble on a flat surface, and it stays put — zero potential energy for the surface it is on. Tilt the surface and the marble will roll toward the lower side. If we force electrons into one of the electrodes (or remove them from the other) we are changing the level of the two. Tilt the surface under our marble by one inch, and we will have a one inch potential difference between the two ends.

The "tilt" of electrical potential is usually measured in volts. The voltage in a common flashlight battery is 1.5 volts, and the voltage you plug your lamps into at home (in the U.S.) is about 117 volts.

Little cars with big motors tend to be quick. Now, to give you some idea of how much "motor

per pound" an electron has, consider this: If we tilt the voltage level of our electrodes by *one* volt, an electron will accelerate by nearly *380 miles per second* between them! Hot stuff, indeed.

If this is beginning to sound too much like Mr. Spock talk, then let me re-phrase (physics majors are permitted to grit their teeth). Imagine that we are dealing with a slingshot. The "Y" shaped handle is the anode, the cathode is the leather (where our electronic marble starts), the elastic is the voltage potential, the phosphor screen is the target, and the magnetic or electronic field is like a wind deflecting the electron's trajectory.

We have one more piece to put in place before we enter the modern era. The "natural" home of the electron is in matter. The nucleus (center part) of atoms have a positive charge, which our negatively charged electrons find very attractive. The electron may be somewhat fickle about trading the positive influence of one atom for another, but it has marked reservations about complete deprivation. It may be persuaded to migrate around within a material (particularly metals) with relative ease, but when it comes to the edge of such a material it draws the line.

In a discharge tube with the electrodes bathed in, say, neon, the electron needs little encouragement to take up with the gas atoms. If we filled our cathode ray tube (CRT) with neon, the electrons would happily fritter away their energy lighting the interior of our TV's and monitors with orange light.

Removing the gas from the tube will give our electrons a clean shot at the phosphor screen, but that will also remove any easy path out of the electrode. There are four common ways to get electrons out of a material, but the one we are interested in is called (drum roll, please) thermionic emission.

We simply heat the electrode, raising the level of energy to the point where the electrons begin to jump free — a sort of electronic hot foot. If you have ever looked at the back of a picture tube or the vacuum tubes in an old radio, you may have seen the reddish glow of hot cathodes. Raise the temperature of the cathode high enough and the electrons "boil" off the surface and into the influence of the anode's attraction.

We now have little factory producing a steady supply of electrons and an anode accelerating them to what even the physicists call "ballistic velocities". When these electrons slam into the phosphor screen, something is going to give. In absorbing the blow of the electrons, the phosphors are boosted to an uncomfortably high energy level. They dissipate part of this energy by throwing off a little packet of energy — a photon — which we perceive as light.

## Oscilloscopes

Of all our senses, vision is probably the most powerful. It seems to be a deep part of our nature to want to see what we are dealing with. The CRT has presented us with an unparalleled chance to do just that — particularly with things electronic. The first wide application of CRT technology was the oscilloscope.

In our investigation of the workings of the CRT, let's say that we have an electrical activity occurring in a circuit that we want to know more about. We have a CRT tube running with the beam focused on the center of the screen. If we then place a metal plate above and below the beam and attach it to the voltage we want to learn about, the beam will be deflected up or down as the voltage changes. Even for a rapidly-changing voltage, you will see a vertical bar that grows in length as the magnitude of the test voltage increases.

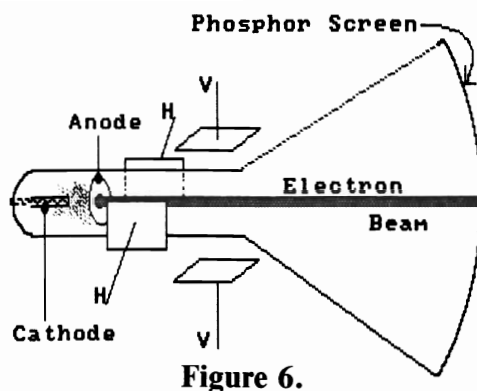
We could even measure the size of the voltages displayed on

the surface of the screen by observing the beam's vertical travel. The rise and the drop in voltage will be echoed by the trace.

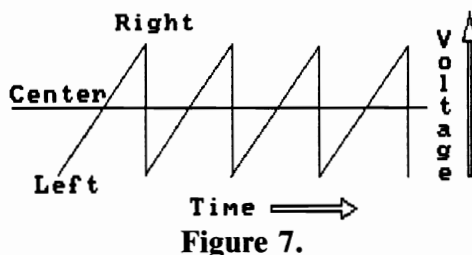
But let's take this a step further. If we add a set of horizontal plates (see **Figure 6**), and connect them to a voltage that regularly changes from positive to negative and back again, the beam will sweep across the tube from side to side. When we do this, we are adding the element of time; the beam sweeps back and forth across the screen like the pendulum of a clock. With our electronic pendulum in motion, if we now reconnect the test voltage the vertical line will expand to show us how the voltage changes over time.

The importance of this time element should not be overlooked. The light emitted from the phosphors will persist long after the electron beam has moved on. Thus, the history of the beam's passing (and the voltage it represents) will be preserved for us to see just as surely as sand records a finger's doodling. In addition, should there be some event that happens very quickly, we can speed up the sweep of the pendulum and spread the trace over a wider space of the screen — thus, we can zoom in on the details of the event. The oscilloscope is a time machine that, in modern form, can easily show us events that occur in *millionths* of a second. The beam will oscillate across the screen, and we can scope it out.

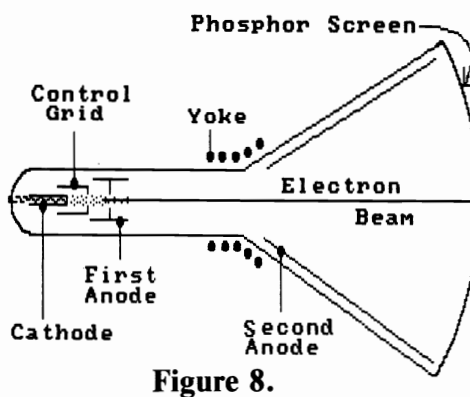
As I have described it, the beam will sweep left to right, then right to left and so on. The vertical message will be folded back on itself. The solution to this is a "sawtooth" voltage. This voltage, when applied to the horizontal plates, will cause the beam to sweep from left to right and then suddenly to start at the left again. In **Figure 7**, the voltage depicted would cause four left-to-right sweeps of the screen.



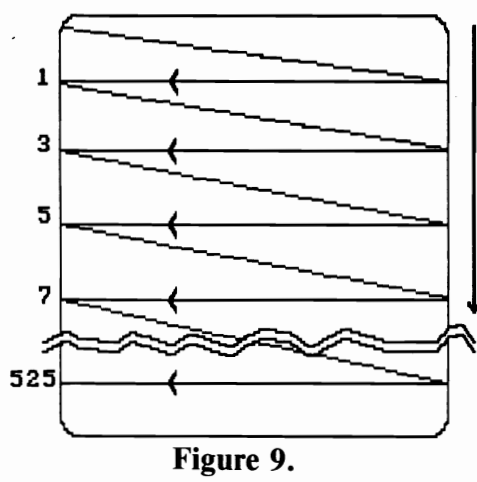
**Figure 6.**



**Figure 7.**



**Figure 8.**



**Figure 9.**

With the appropriate support circuitry, the oscilloscope can show us a very wide range of electrical events, but the TV's and monitors which interest us are more specialized devices. Before we place our CRT in this specialized setting, let's take another look (**Figure 8**) inside the truly contemporary device it has become.

First, in order to get a picture rather than a tracing on the screen, we will want the electron beam to cover the entire surface of the screen. That means that in addition to the horizontal sweep we did with the oscilloscope, we will need a vertical sweep as well.

Taking this a step at a time: the vertical signal will bend the beam to the top of the screen, the horizontal signal will sweep across the screen and return to the edge where it started, the vertical force moves the beam down a notch and the horizontal counterpart sweeps again. This combination of motions will paint the entire surface of the screen. When the horizontal force has swept the bottom-most line, the vertical signal then moves the beam to the top of the screen and the whole process starts again. See **Figure 9**.

You may have noticed that **Figure 9** shows odd-numbered lines only. The full picture (as defined by the TV broadcast system used in the U.S.) consists of 525 horizontal lines, but the lines are drawn in two passes. What is shown is a single pass, but if you shift the entire scan pattern down half the distance between lines one and three, the even numbered lines will appear.

Each 1/60 of a second a screen of lines is drawn. The next pass draws the lines between the previous ones. Thus, every 1/30 of a second 525 lines are drawn. This technique is called interlace scanning, and a few personal (such as the Amiga) computers are capable of drawing the full 525 lines. Lesser computers simply draw the

same 262 (half of 525) lines over without a shift. This is much less expensive to do, but it cuts the vertical resolution in half.

The element in the TV or monitor that effects the horizontal and vertical sweep is called the yoke. It is nearly the equivalent of the charged plates we saw used in the oscilloscope. Physically, they are made up of complex loops of wire that carry the horizontal and vertical control voltages. The yoke gets its name from the fact that it really does look like something you would put on a horse or an ox to pull a plow or a wagon — that and the fact that it fits around the neck of our CRT bottle.

In principle, its operation is little different from what we have seen before, except that it has one additional primary function. We have been talking about bending “cathode rays” much as you might bend light rays with a glass lens. We all like big pictures on our TV’s, but none of us wants a picture tube that is five feet deep. The yoke functions as an electromagnetic lens to fan out the electron beam much like a (double convex) glass lens.

In the interest of gaining an entire screen to work with, it seems we have given up control of both horizontal and vertical sweeping. How, then, can we do anything but look at a blank screen? Well, we can *still* control the electron gun (or sling shot, if you prefer) by using the “control grid”.

The control grid, despite its name, works very much like an anode. It operates at a much lower voltage, however, and is thus easier to control. Now we have our heated cathode boiling off a cloud of electrons and the “first anode” is ready (at about 200 to 400 volts) to send them slamming into the phosphor screen.

The control grid’s voltage can run anywhere from zero to  $-60$  volts (notice the minus sign). At its full minus voltage it prevents the cloud of electrons from reaching

the anode — no electrons are accelerated into the screen, and the screen is dark. At zero volts the grid allows the full production of electrons to pass through the anode — maximum brightness on the screen. Thus, by varying the voltage on the control grid as the path of the beam is swept across and down the screen, we can create light or dark (or anything in between) areas on the screen.

This method of producing a picture composed of closely-spaced horizontal lines is called raster display. **Figure 10** shows a diagram of how a small plus sign might be made to appear on a screen. It’s all a matter of timing. As the beam (or where the beam would be if the control grid were allowing electrons to pass) reaches the middle of line one, the grid voltage drops to zero. Splat. A group of electrons lights up the phosphors. The grid then shuts down (goes full negative) until the beam nears the center of scan line three. Splat, splat, splat. The control grid releases three puffs of electrons. Line five is a repeat of line one, except at a later time, and we have our plus sign.

If we wish our plus sign to remain on the screen, we have to rely on the slowness (persistence) of the phosphors in emitting light. After the phosphors have been energized, they will continue to emit light until the beam returns to the top of the screen. If we then repeat the action of the control grid, the plus sign will be refreshed, and all those mortal folks sitting out there will think it was there all along.

You see, it is quite forgivable for people to have missed this speedy slight of hand. In a typical TV or monitor, the screen is rewritten 60 times a second, and about 262 lines are painted on the screen each time — that’s 15,750 lines a second (to say nothing of the “dots” that make up each line)!

Before we get too far away from the CRT illustration (**Figure**

**8**), I should explain that “second anode”. Usually it consists of just a metallic surfacing on the inside of the tube. It does a sort of clean-up job. When the electrons collide with the screen, it’s not only photons that are emitted. Other electrons are knocked loose as well. After all, a busy CTR screen is having a lot of electrons thrown at it! They are not destroyed; rather they are used to deliver the energy they acquired (in acceleration) to various parts of the screen. If not removed, they would “pile up”, so the second anode (with a voltage ranging between 12,000 and 25,000 volts) is used to collect them and conduct them away.

One other point should be made here. Heat is also produced (remember how the foil was heated in the discharge tube?). The gun in most monitors is capable of supplying at least enough high velocity electrons to keep a whole screen continually lit. By turning up the brightness control, it is possible to over-power the phosphors in the lighted area. This is especially true when displaying small amounts of data (say a screen full of text). Short periods are OK, but leave the same display on for an extended period and you can literally burn the image into the phosphors on the screen.

A word to the wise: if you have been working in a brightly-lit room (that’s when the brightness control is usually set highest) and you are going to leave the machine alone for a while, turn off the monitor; or at least turn the brightness down.

## Color

How is a color image produced? First, a little color theory. Most people are more familiar with mixing paints, such as blue and yellow to get green. Paints, however, work by absorbing light. A dark blue paint is soaking up all the light colors except blue, so, when you look at it, all the eye can



see is blue. Put a white page with red print under a red light and the print seems to disappear. The red ink reflects all the red light, but so does the white page. Since there is only red light to be reflected in the first place, there is no way for the eye to tell where the ink is.

Color emission is another matter entirely. When you mix light sources, you are mixing by addition. Shine a blue light and a green one on the same spot, and you will get something in the yellow range. Mix all your paints, and you approach black. Mix the full range of light sources, and you get white.

The primary colors used to mix others in light generation, are red, green and blue, and since a CRT is a light source, those are the colors used to produce the full range of a color picture. Areas of the surface of the screen are coated with transparent color filters (like the stained glass windows in a church) before the phosphors are applied. These areas are quite small, and are not normally perceived by the eye as being separate from one another.

One early method (which is still in use) was to place three dots of the primary colors in a close, triangular proximity. Due to their small size, the eye perceives them as a single dot. And, because they can be turned on independently to contribute the red, green or blue light needed for the final mix, the perceived dot can be changed to appear as any color.

The displays we use with our computers grew out of television technology. At the time when color television was first proposed, there were millions of black and white sets already in use. So, rather than trash all those sets or create a competing broadcast system, a way was found to make the two co-exist. Color information was very cleverly added to the existing broadcast signals. The upshot of all this is that the raster system used is the same for both

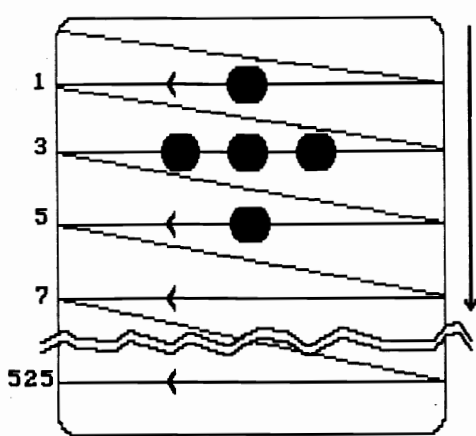


Figure 10.

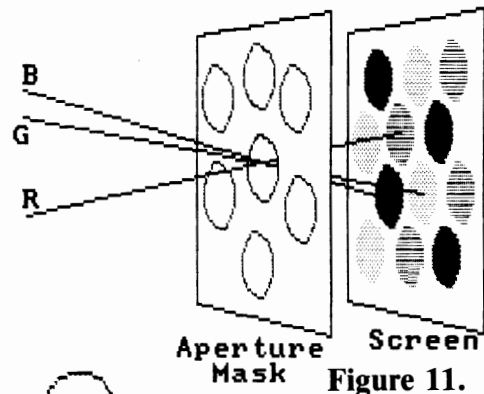


Figure 11.

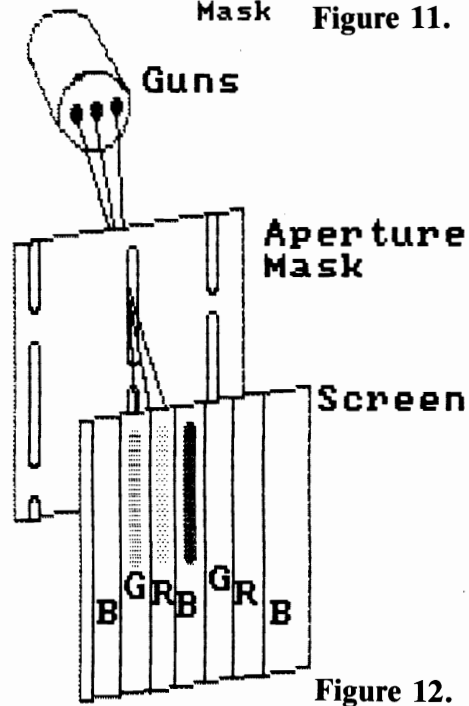


Figure 12.

black-and-white and color systems.

The difference, aside from the "colored" phosphors, is that the color CRT has three guns. Circuits are used to separate the color information from the rest of the broadcast signal. This information

is then used to run a separate control grid for each gun. These three guns are packed tightly in the "cork" area of the basic CRT, and they share the rest of the tube.

Now, since the guns are separated by a certain distance, the beams they produce are also separated and run through anodes and the rest in parallel paths, reaching the screen at slightly separate locations. But it is not possible, at a reasonable cost, to tighten control of the beams to the point that they illuminate only their target dot.

Geometry to the rescue. Imagine for a moment that you are standing across from a wall. There is a sheet of plywood between you and the wall with a small hole in it. If you hold a flashlight in each hand and shine them at the hole in the plywood, two separate spots of light will appear on the wall behind. The plywood forms a sort of mask that prevents overlapping of the flashlights' beams. Just such a device, an aperture mask, is included in a color CRT. See Figure 11.

Initially all masks had round holes in them and both gun and dots were arranged in a triangular pattern, but the trend these days is to a slot mask (shown in Figure 12) with the guns arranged in a row. Since this system allows the phosphors to be shaped into bars, it minimizes wasted screen surface area. The result is a brighter picture.

### Conclusion

Well, there you have it. We have covered the evolution of the CRT, from its beginnings in the last century, on up to the color CRT of today. You now have a pretty good idea how a CRT produces an image. Next month, this space will be devoted to the various ways computers produce video signals, how TV's and monitors cope with those signals, and how the two can be made to work together. Quick now, how many electrons in a pound?

# The Bud Izzit Art School

## Bring 'Em Back Alive

by Eddie Johnson

*Editor's Note: Bud couldn't find time to write this column again this month because of his obsession with trying to become the first artist in space. He did find time for this brief note, however: "Write your congressperson and demand his/her support for a one percent for Art bill to be added to NASA's operating budget. Also drop a hint that Bud Izzit be the recipient of the first grant under this bill!" This month's column is again written by (surprise!) Eddie Johnson.*

The very first video game I ever played was a VIC-20 version of **Pac Man** that someone gave me soon after I got my computer. Like everybody else, I got quite thoroughly "hooked" on it — for about a week (until I achieved what I know to be my lifetime high score!)

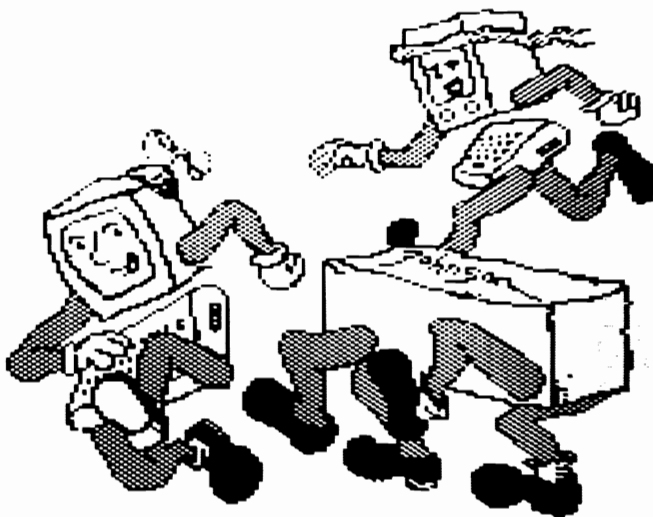
The thing that amazed me (pardon the pun) the most about the game was the way the "ghosts" seemed to know exactly where I was in the maze, and they would actually pursue me! I thought if I could figure out how they could do that, I could write a little game of "tag", sort of like our cartoon mascots are playing, with a block on the screen to dodge behind. Well, when I finally got around to trying it, it turned out to be a very easy thing to do, and the game changed into something a little different.

In this game, you are "Commodore Muffet", a wild animal trapper working on the planet "Tuffet", which is noted for its giant spiders. You have a contract with the Terran IntraGalactic Zoological Society to provide them with ten live specimens of these creatures for their Interplanetary Zoo.

Fortunately, the spiders are very easy to find. In fact, *they* will find *you* ! They are highly aggressive, voracious carnivores, and will pursue anything that moves (but only when it's moving). They are also very stupid, and they do not see very well, so the most effective way to trap them is to lure them into your force-field net with your "zeep" (which is an anti-gravity jeep.)

The zeep is armored, so you are protected if one of the spiders should actually catch you — they are very fast — but they are so powerful that they can cause a hundred credits' worth of damage to your vehicle. This is not good, because you only get fifty credits for every one you catch. It also behooves you to be as efficient as possible in trapping them, because the zeep burns one credit's worth of fuel for every move you make!

When you RUN the program, the screen will clear after a few seconds, and three objects will be randomly placed on the screen: a blue ball (that's your zeep), a red asterisk (the spider, of course), and a black checkerboardy thing that represents



your force-field net.

You maneuver your zeep from the keyboard. On the VIC-20, use "Z" for up, the space bar for down, the / (division sign) for left, and the CRSR down for right. On the C-64, the controls are: "T" = up, "F" = down, "X" = left, and "C" = right. There is a good reason for this weird selection of keys, which I will explain later.

You will notice that if you drive your zeep off the edge of the screen, it will re-appear at the opposite edge. Since the spider can't follow you off the screen,

this will become an important part of your strategy as you try to trick it into running into your net. Be careful not to run into the net yourself, because you will destroy it, and a new one will cost you fifty credits!

Although this program is written in BASIC, it has features that make it run very fast. A lot of this is due to the use of the array which we DIMension in line 10 and build in line 20. Notice that we are using an integer (%) array to save memory.

If you study these lines closely, you will see that we have "re-designed" the screen memory map into a graph with true Cartesian co-ordinates (with 0,0 in the lower left corner where it belongs!)

This increases our speed of execution in a couple of ways: it provides a "look-up table" for the screen memory (I don't know why this should be faster than POKEing the screen memory map directly, but I've been told that it does), and it allows us to perform some really slick programming in line 60 which eliminates about four decision blocks (IF ... THEN statements.) Let's look at line 60.

X and Y are the horizontal and vertical positions for your zeep, while SX and SY are the co-ordinates for the spider (NX and NY are, naturally, the locations of your net). Because of our screen array, the vertical positions are separated by increments of one (Y + 1 to go up, Y - 1 to go down), rather than the usual 22 for the VIC or 40 for the C-64. Therefore, for the spider to find the zeep, we can compare the positions X,Y and SX,SY and add either 1, -1, or 0 to move the spider to its next position (closer to X,Y).

This could be done with four IF ... THEN statements, but it would slow the program tremendously and gobble up valuable memory (the array took lots of that already!)

But, "Aha!" I thought. There is a function in BASIC, namely, SGN(N), that will return one of the three necessary numbers (1, -1, or 0) depending on whether N is positive, negative, or zero. Thus, by subtracting the spider's position from that of the zeep (X - SX and Y - SY), taking the resulting SiGNs, and adding them to SX or SY, we can establish the new spider position in two lightning-fast calculations!

Lines 110 and 120 also help speed up the program. Did you know there is a third way to input information into a running program in addition to the GET and INPUT statements? Try RUNning this one-liner:

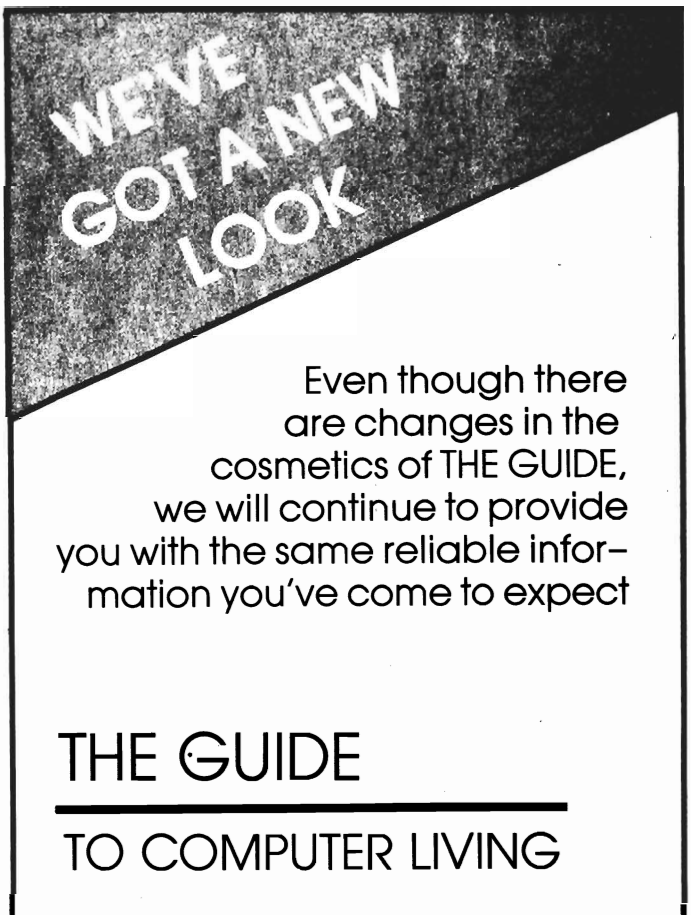
```
1 PRINT PEEK(197):GOTO1
```

(You could also use PEEK(203) which will give the same result!) A long line of "64"'s should now be running down the left side of your screen. Now try pressing different keys, and notice how the number changes. Also notice that these numbers are different from the familiar ASCII codes, and are in fact dif-

ferent numbers on the VIC and C-64.

Again, in order to avoid using four IF ... THEN decision lines, I selected four keys whose numbers were consecutive and which had a more-or-less logical keyboard configuration to use as cursor controls. Since the PEEK(197) numbers are different on the two machines, I had to use different keys and a different formula for the VIC and the C-64. Subtracting 29 on the VIC and 19 on the C-64, we reduce these numbers to a range of 1 to 4, which allows us to replace the IF ... THEN's with a single, more efficient ON GOSUB in line 120.

Recently, I've been hearing a lot of negative criticism directed at the BASIC programming language. I hope that some of the little tricks that we've been exploring in this series have demonstrated what a powerful and versatile tool this language can be, if it is used with a little imagination. Don't ignore all those commands and functions that it has, which at first glance may seem utterly useless for graphics or game programming. If there are any that you haven't experimented with, I strongly encourage you to do so. The manual won't tell you much about them, so you



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LOOK

Even though there  
are changes in the  
cosmetics of THE GUIDE,  
we will continue to provide  
you with the same reliable infor-  
mation you've come to expect

---

THE GUIDE  
TO COMPUTER LIVING

will have to exercise your creativity and intelligence to figure out uses for these tools. Let your ingenuity be your guide! I suppose you have guessed that this will be part of ...

### Challenge #6

Find a command or function in the user manual that you've not used before and write a short program to use it in an interesting way. Another thing you might try is to take something you have learned (or are trying to learn) in math class and use it to do

something interesting with graphics of sound. (This is an excellent way to learn both programming and math!) Maybe just try to re-write **Bring 'Em Back Alive!** so that you are the pursuer, trying to "herd" the spider into a "corral". Can you find a way to make the game even faster and more efficient?

As always, send us your best programs. *Happy exploring!*

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## Bring 'Em Listing for C-64

By Eddie Johnson

```
1 rem ***** bring 'em back alive! *****
2 rem ***** commodore 64 *****
3 rem ***** by eddie johnson, '84 *****
5 rem to move "Q": "t" = up, "f" = down,
  "x" = left, "c" = right
6 rem lure "*" into "[cmdr-+]" to score.
10 dimg(39,24):p=1984:c=54272:deffnr(n)=
  int(rnd(1)*n)+0
20 forx=0to39:for y=0to22:g(x,y)=p:p=p-40
  :next:p=p+921:next:sc=100
30 n=39:sx=fnr(n):nx=fnr(n):x=fnr(n):n=2
2:sy=fnr(n):ny=fnr(n):y=fnr(n)
40 ifsx=nxandsy=nyornx=xandny=yorx=sxand
  y=sythen30
50 poke53281,1:print"[clr]":pokeg(nx,ny)
  ,102:pokeg(nx,ny)+c,0
60 pokeg(x,y),81:pokeg(x,y)+c,6:pokeg(sx
  ,sy),32:sx=sx+sgn(x-sx):sy=sy+sgn(y-sy)
70 pokeg(sx,sy),42:pokeg(sx,sy)+c,2:ifsx
  =xandsy=ythensc=sc-100:goto200
80 ifsx=nxandsy=nythensc=sc+50:goto200
90 print"[home][rvs on][red]$ [left][
  left][left][left]"sc,"*10-t:ift>9then21
  0
100 m=peek(197)-19:ifm<1orm>4then100
110 sc=sc-1:pokeg(x,y),32:onmgosub140,16
  0,180,120:goto60
120 x=x-1:ifx<0thenx=39
130 return
140 x=x+1:ifx>39thenx=0
150 return
160 y=y-1:ify<0theny=22
170 return
180 y=y+1:ify>22theny=0
190 return
200 poke54296,15:poke54277,32:poke54278,
  32:poke54276,33
201 forn=0to255:poke54273,n:poke54272,n:
  getv$:next:t=t+1
202 poke54276,32:poke54296,0:goto30
210 input"[blu]again";q$:t=0:sc=100:ifle
  ft$(q$,1)="y"then30
```

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## Bring 'Em Listing for VIC-20

By Eddie Johnson

```
1 rem ***** bring 'em back alive! *****
2 rem ***** unexpanded vic 20 *****
10 dimg(22,22):p=8164:c=30720:deffnr(n)=
  int(rnd(1)*21)+0:s=36875:pokes+3,15
20 forx=0to21:for y=0to21:g(x,y)=p:p=p-22
  :next:p=p+485:next:sc=100
30 sx=fnr(n):sy=fnr(n):nx=fnr(n):ny=fnr(
  n):x=fnr(n):y=fnr(n)
40 ifsx=nxandsy=nyornx=xandny=yorx=sxand
  y=sythen30
50 print"[clr]":pokeg(nx,ny),102:pokeg(n
  x,ny)+c,0
60 pokeg(x,y),81:pokeg(x,y)+c,6:pokeg(sx
  ,sy),32:sx=sx+sgn(x-sx):sy=sy+sgn(y-sy)
70 pokeg(sx,sy),42:pokeg(sx,sy)+c,2:ifsx
  =xandsy=ythensc=sc-100:goto200
80 ifsx=nxandsy=nythensc=sc+50:goto200
90 print"[home][rvs on][red]$ [left][
  left][left][left]"sc,"*10-t:ift=10then2
  10
100 m=peek(197)-29:ifm<1orm>4then100
110 sc=sc-1:pokeg(x,y),32:onmgosub120,14
  0,160,180:goto60
120 x=x-1:ifx<0thenx=21
130 return
140 x=x+1:ifx>21thenx=0
150 return
160 y=y-1:ify<0theny=21
170 return
180 y=y+1:ify>21theny=0
190 return
200 forn=128to255:pokes,n:getv$:next:pok
  es,0:t=t+1:goto30
210 input"[blu]again";q$:t=0:sc=100:ifle
  ft$(q$,1)="y"then30
```

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# Computer Widow's Compendium

by Lyn Chase

My husband has a girlfriend. Besides me, I mean. They're not even being discreet — she's moved in lock, stock and barrel, complete with her cases and even her pet mouse (which she has the gall to keep on a leash!) The new object of Randy's affection is, of course, an Amiga computer, Commodore's latest creation.

I must give the developers credit where credit is due. The name "Amiga" apparently comes from the Spanish word of the same spelling for "girlfriend". Someone has finally publically recognized the seductive powers of "personal" computers and has told it like it is. This little lady is keeping my husband busy until three or four o'clock most mornings. (He does, however, sometimes take a break for Friday night videos.)

What's she got that I haven't? My husband, for one thing. But she also has an alluring voice — it sounds like a male Venutian who has captured neither the intonation nor the emotional capabilities of language. I chatted with this lady with the man's voice when I took time out from vacuuming to look at a program Randy had running called **Racter**.

This program is, without a doubt, the most peculiar program I have ever seen for a computer. This male voice with the flat effect and the plugged up nose talks to the person at the keyboard. Literally. You can type him questions and he responds. He is particularly adept at answering yes and no type questions, but can also answer "feeling-type" questions.

I asked him if he felt cramped in the computer and he said no. Then he went off into a tirade about famous authors and poets. He also asked if we were related to Clarabell Chase, someone he had met from Portland. Every now and then he sneezes and sniffs. Apparently this is to convince you that there is a reason for his "stuffy" sound. This program cannot be classified as a game. Or as educational. Or as utilitarian. It can only be classified as peculiar.

Yesterday evening, while Jonathan was napping, Randy showed me more about the Amiga. Her pet mouse that I mentioned is a plastic box with a wire connecting it to the computer, two square buttons on the top, and a ball on the bottom. When you move the critter around on a flat surface, the ball on the underside rolls and moves the cursor. (For those of you who are used to looking at the other Commodore computers, the cursor is the flashing square on the screen. On the Amiga, the cursor is a little arrow that can go just about anywhere.)

I have not yet figured out the purpose of the two buttons on top, but they have something to do with making choices. Were the choice up to me, I might add a third button that the computer could use on its own. That stuffed-up-nose voice could say, "Beam me up, Scotty."

The Amiga has a few features, from what little I saw of it, that could only be described as "user friendly". For those of you not familiar with this term, let me explain: This term was coined eons ago when personal computers were first coming into being. The

purpose was to seduce that portion of the unwitting public who were suggestible and easily manipulated into spending thousands of dollars on equipment that one could learn to use in a matter of years. To play games. And to balance the checkbook.

Anyway, as I was saying, the Amiga has some features that make it "easy to use". When you turn the computer on, it shows you a picture of what to do next.



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You have to put a particular disk into the disk drive a certain way. The computer shows you which disk and which way. Once that disk is loaded in, I have no idea what to do. But when you turn it on, it's user friendly.

Another thing I noticed is that when the computer is busy doing something and you try to tell it to do something else, a cartoon-like bubble comes on the screen with z-z-z-z-z to show that it is already occupied. I think that the bubble should have shown a mop and bucket. Let's have a little recognition for those of us who are too busy to learn how to use the mouse.

The Amiga's disk drives are quieter than the other ones I've heard, and the disks are smaller — about three-and-a-half inches across. And to the delight of computer widows everywhere, not only are they brightly colored, they cost about five times as much as disks for the other Commodore computers. And the little plastic boxes to hold a bunch of disks cost a lot, too. (Heaven forbid that they should use a box that doesn't come from a computer store.) The Computer Widow aims to be fair at least once a decade so, in defense of these new little disks, I feel obligated to tell you that they hold more information than the

larger old-fashioned disks that are used on the hopelessly outmoded personal computers built more than six months ago.

Okay, okay, I just spent a little more time with the little lady and discovered that she can speak in a female voice — sort of. And I *did* figure out what the buttons on the mouse are for. And I played some other games on the computer ... and they *were* sort of fun.

Well, okay, she has some drawing power. And I can see why a person would want to spend time with her. To you, Amiga, I say this: You can keep him busy at night but you can't keep him warm ...



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# I'm Sorry, But I Don't Speak Hexidecimal

by Shelly Roberts

This weekend I discovered an entirely new social phenomenon: Commodore Company!

No, no. Not those perfectly wonderful folks in West Chester, Pennsylvania who have installed an open drain into my money market account. No, I'm talking about those perfectly wonderful folks in any other part of the country than where you live, who call up on a Thursday night and say, "I'm coming into town for a day or so, and do you have a soft piece of floor I could borrow for the night?"

Nothing unusual about that. Why, Aunt Ida Mae Whitten does that all the time from Coeur d'Alene. So do third generation friends of people you barely knew in high school. What with the price of hotel rooms and all, surprise company is hardly any surprise.

These people call you up. They sound modest and humble. Often they even sound civilized. And you end up taking them to restaurants requiring shoes and a shirt, and the first third of your Visa card. You cancel all your own long-awaited plans, go out and buy six-dollar-a-pound English crackers with absolutely no taste, spend an evening boring yourself to tears, and then give up your own bed because the lumpy couch in the spare room would be much too uncomfortable for dear, dear Aunt Ida Mae. It would also make a bad impression on an invading stranger.

Everybody gets that kind of company. Nothing new there.

No, what I'm talking about are seemingly simpatico people you met only once before at a computer fair. Or someone you passed a lonely night with on PlayNET, alternately beating at Trivial Pursuit, teasing and tempting at a safe long distance, and pouring your guts out to just because you didn't know what country Venetian Blinds were invented in (Japan), and because it's 2:45 in the morning.

People you meet at foreign user groups in strange cities when you're stuck there on business and don't want to while away the hours downstairs in the Holiday Inn Hillbilly Lounge are likely candidates for becoming Commodore Company, too. As well as people in your own group who are having their apartments painted.

You don't have to entertain Commodore Company and Commodore Company never hands you a bottle of wine when they walk in the door. They bring a disk box discreetly filled half with "public domain" for you to copy and half with blanks to copy what you have that they don't.

Commodore Company doesn't require that you go to the Korean Grocery to buy grapes with stems that have been individually manicured with wire snips. And Commodore Company *prefers* to sleep in the room with the lumpy couch ... because that's where you keep the computer.

You don't have to dress up for Commodore Company. You may not even have to bathe.

What you *do* have to do with Commodore Company, is very

shortly show them the way to the room with your computer.

My Commodore Company this weekend was someone who had come to the city to talk to a User Group. We had been chatting for about twenty minutes, a sort of polite warm-up period before booting anything, when my phone rang. It was someone needing an



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emergency car fix. Since I had asked the precise favor the previous week, I could hardly refuse.

But what was I to do with my stranger-guest?

It was then that I began to understand the true concept of Commodore Company.

I explained the situation, walked her into the computer room, pointed to the wall unit with the boxed programs waiting for reviewing, pointed to the boxes of hand labeled disks, hooked the modem onto the machinery, hauled in the telephone and left to find my jumper cables.

Two and a half hours later, I walked into my computer room to

see the back of my Commodore Company happily finger-tapping to a few hundred of her closest friends accessed through the local telephone network. Had she noticed I was gone? Are you kidding? She was at the computer. What is time? I had to slip food under her elbow to even barely get her attention.

In the morning, as any good hostess, I arose early to help my guest awaken to make her very early train. She was *still* sitting in my balans chair at the console. I pulled the plug out of her vein, got her a cup of coffee and sent her on her way.

What did I get out of all this?

Well, I got a couple of disk copies of something the company actually asks users to pass on. I got a permanent addiction to on-line telecommunicating. I got a place to stay, and a computer to use when I am in her city, which, it turns out, will be quite soon. I got a new Commodore friend. And I got a clear understanding of the difference between ordinary everyday, run-of-the-mill, garden variety visitors and Commodore Company.

What I haven't gotten yet is my phone bill.

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# Real Gamers

## Don't Read Instructions

by Robert J. Sodaro

As I sit down to write this column, I am anxiously awaiting the summer CES show in Chicago, and all the really nifty toys I can suck up while I'm there . . . er, uh, get info on so I can review them for you fine folks. In the meantime, I've a few gems I'd like to lay on you this time around.

The first pair is from Woodbury Computer Software. Anyone familiar with late night TV has seen ads on their local channel for children's books where you can insert your child's name, address,

school, friends, and pet into the storyline. Well, Woodbury has taken this concept one step farther with their **Playwriter** series.

There is, as the old saw goes, one good book in everyone. The premise being that anyone should be able to tell at least one story well. While this may have once held true, it is not necessarily as hard and fast a rule as it once was. No, people have *not* become more well read, rather it is now easier to tell stories . . . at least it is with the assistance of Woodbury's **Playwriter** series.

In 1985, Woodbury introduced its **Playwriter** series with two

titles, **Adventures in Space**, and **Tales of Me**. Both proved to be very successful products, attracting much well-deserved praise for Woodbury. Well, folks, Woodbury has done it again. They have two new titles in their line, **Castles and Creatures** and **Mystery!**

The first is a fantasy filled adventure, and the second is — appropriately enough — in the flatfooted detective mold. Neither book (for that is in fact what they are), is simply a game dressed up as an educational tool. Interestingly enough, while they were designed for a younger audience, I have discovered that older users get as



much (if not more) fun out of them.

Just like their other books, **Castles and Creatures** and **Mystery** allow the user to write a story utilizing a framework served up by the software. The package also provides the user with all the other tools necessary for writing and producing their own books. In addition to the software used to create, edit, format and print the story, there are also the means to create the book: a hardbound cover, pre-sized fan-fold paper, as well as self-adhering stickers with which to illustrate it.

Users are able to list their name (as author), dedicate the book to someone, and give themselves a brief bio at the end. Still, one should not simply dismiss either one of these products as simple diversions for the young. As a bonus, several skills can be acquired while using the software to create a book.

First, the user's own creativity is enhanced. Users don't have to be married to one story but can re-write the entire story to their heart's content (additional book parts can be purchased so variations can be written, and "published"). Second, purely mechanical skills will be accrued while writing and editing the book. It's almost like using a word processor, and can serve as an intro to such software.

Third, the user can have hours of fun with the initial software package, even without purchasing additional book materials. Unlike other types of "gaming" software, the outcome of this program depends wholly upon the mood and number of users. It is highly unlikely that similar storylines would emerge from different sittings. Besides, if one ever becomes truly bored with either of these products, Woodbury has several other similar books, with more still to come.

Woodbury Software, 127 White Oak Lane, CN1001, Old

Bridge, NJ 08857, phone (201) 679-0200.

Next up is a truly silly piece of software from John Henry Software called **Party Songs**. Promotions for this game tell us what fun it would be to sit around watching a static image on the screen, and singing songs that were old when electricity was discovered. Some fun, eh?

This type of software reminds me of an article I once read in *Mad Magazine* about the joys of owning a fish tank. As I recall, the article read to the effect that with a fish tank, you could:

- a) Sit and watch the fish swim.
- b) Invite a friend over and watch the fish swim.
- c) Invite a bunch of friends over, have a party, and watch the fish swim, or
- d) Get drunk and drink the tank water ... ad nauseum.

Much the same can be said about this software. It is dull, *dull DULL!* To me this is the worst kind of software out there, since it does no more than to provide us with something we already have ... a record player. Sure, it provides us with a picture and our record player doesn't, but if I want my music to move, I'll watch MTV thank you. My advice is to stay away from this particular product, as your money (\$16.00) can be better spent elsewhere.

One place that will provide you with more entertainment is Epyx' **The Temple of Apshi Trilogy**. This game combines all three previous Apshi releases, **Temple of Apshi**, **Upper Reaches of Apshai**, and **Curse of Ra**. All three of these games were hits in their singular forms, and combined have created a monster hit for Epyx. Like its predecessors, it serves up the standard role-playing requisites, the opportunity to pick characters, names, dungeons, and characteristics. Also, as in the singular versions, the hero wanders through a maze of

dungeons slaying dragons, ghouls, and other beasties.

Some minor changes have been made in the transition from the individual versions of the games. Originally, the figure was small, and you could view several rooms of the dungeon at the same time. Also, once you entered a room, the room remained lit, so you could always tell where you had been. In **Trilogy** the figure is much larger, and much better illustrated, but the rooms are smaller, and once you leave them they become darkened. While these don't detract from the game, I believe that I preferred it the other way. No real matter, as this is still an awesome game. My highest recommendations.

\$39.95, from Epyx, 1043 Kiel Court, Sunnyvale, CA 94089, phone: (408) 745-0700.

Well, that's all I have time for this run, but next time out, I promise a bunch of new stuff, straight from CES in Chicago.

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# Swing Into Superb Golf Graphics With Leader Board

by Randy Chase

The Carver brothers, Bruce and Roger, (better known as Access Software) have long been among the forerunners in utilizing the graphics capabilities of the Commodore 64. Their latest release, **Leader Board** is a very pleasant change of pace from many of their earlier titles. They've shifted from the military arcade world to the golf links, and the result is one of the most playable sports arcade games I've had the pleasure of reviewing.

There are a number of very innovative features in **Leader Board**; perhaps the most impressive being that once you initially load the program, you have in memory four *complete* eighteen-hole golf courses! By using a system of predefined geometric shapes rather than storing screens to depict the holes, you can play your way around 72 unique holes without ever waiting for the program to load in more data from the disk drive.

It should also be noted that while **Leader Board** does use a fast loader within the software, it also provides for a "slow" option for those third-party drives that might prove to be incompatible with the fast load.

Golf is a very subtle game, simple in concept and theory, but

infinitely complex in the realization of those simplistic premises. The combination of the intellectual challenge and the delicate balance of coordination and timing should make golf an ideal model for a computer simulation.

Prior to **Leader Board**, however, very few of the golf simulation programs have come

close to capturing that certain "feel" that makes golf an obsession to so many people. Access Software, however, breaks that barrier with **Leader Board** by combining superlative graphics with a very clever implementation of joystick controls, emphasizing the use of timing and coordination in order to achieve that perfect swing.



More than luck will be needed to sink this 60-foot putt. Lots of power and attention to the break or slope (small shadowed stick) indicator will be needed as well.

Equipped with a full complement of 13 clubs and a putter, and with the challenge of four full-length courses waiting to be played, **Leader Board** will accommodate up to four players, allowing each to choose from three levels of difficulty. When you graduate to the pro level, you're facing the added challenge of making adjustments for both the direction and strength of the wind. As in the real world, the wind will prove to be a larger factor when using your short irons.

While the design of the joystick controls is really quite simple, the subtleties of mastering it are not. Fortunately, Access has provided a driving range, where you can opt to practice with the various clubs prior to teeing off. Even a veteran player will most likely want to spend a little time at the range prior to playing, just to make sure that they are truly ready.

After selecting a club, and aiming your shot, control is all dependent upon the fire button on the joystick. The amount of power

is controlled by how long you hold down the button during the back swing. The longer you press down, the fuller and harder the swing. After releasing the button to set the power, the accuracy of the shot is largely affected by again pressing the fire button at the time of impact with the ball.

Hitting too early will "hook" the ball to the left, and hitting the button too late will "slice" to the right. With experience, a player can learn to hook or slice the ball intentionally, which can be a vital tool in adjusting your play to accommodate the influences of the wind. In the earlier stages of learning the game, however, both are something you will try to avoid.

Once you reach the green, putting is simply a matter of aiming your shot and controlling the power of the putt by holding down the fire button. Actually that is very deceptive because it's not that simple in practice. Unlike the other golf games I've played, **Leader Board** features greens with a variety of slopes. These are not

flat putting greens! Each has its own unique slope and reading the break correctly requires practice. Unfortunately, they neglected to include a putting green for practice.

The four courses included in **Leader Board** (and the four additional ones available on another disk) are all very unforgiving of your mistakes. I really doubt you'll ever find a combination of courses as water-oriented as these. You don't need a golf cart here, you really need a motor boat. My biggest single criticism of the game is that there are no sand traps and there are no trees, but instead every single hole is either bordered by water or stretched over a series of islands. While this makes for a very challenging game, it also tends to lend a feeling of sameness from hole to hole and course to course.

I talked to Access about this shortcoming and they indicated that they've had considerable input from users and will probably, at some point, offer a revision that includes these more realistic hazards. They did say, however, that the programming required to realize sand traps and trees and the subsequent impact that they would have on the flight path of the ball would dictate reducing the number of courses held in memory. To have trees and sand traps at the expense of having only two or three courses in memory would be an exchange I'd gladly make. They went on to say that they have other projects (including a bowling simulation) underway that are of a higher priority than revising **Leader Board**.

All in all, even with the overabundance of water, **Leader Board** remains the best attempt I've yet seen at simulating the challenges of golf on a computer. If you haven't tried this one, you're missing one of the best games of the year.

ROUND 1		LEADER BOARD		ROUND 2	
ARNOLD	4	6	4	E	
SALLY	5	6	4	3	
GARY	5	4	4	6	
DAVE	5	3	4	7	

After each hole, your scores are reviewed on the **Leader Board**. "E" represents even par, plus numbers are the strokes over par, and minus numbers, strokes under par (our photographer's not that good, yet).

# Sequential File BASICS — It's Easy to Do It Yourself

by Rod Diegel

## Is bigger better?

Sometimes the simplest programs can do more for you than the big ones. Nearly everyone has been there. You have a job that you want your computer to do for you. Not an elaborate or complex job, but one that you certainly don't want to do by hand.

You start thinking about the programs you have or even the ones you know about, but nothing seems to fit. There are the big commercial programs that everybody says will do everything but wash the car on Saturday. These programs can have two major costs, however.

In the first place, they can soak up a lot of money. Secondly, and probably more importantly, they are going to cost you considerable time to learn. The more powerful and flexible the program is, the more likely you are to be able to get the thing to do the job you had in mind, but, as the power and flexibility grow, the more difficult the program is to master.

What starts out as a small job can quickly turn into an expensive course in database or spreadsheet management. There can even be a loss of freedom in this approach; after having gone to all the trouble of acquiring and learning a large program, you feel almost obligated to use only it (it's supposed to do *everything* isn't it?).

In any case, even if you can successfully apply the "does-it-all" program, by the time you are finished with your small job you may have spent *more* time than if you had just done it by hand!

## Small solution ?

Small programs usually have small pricetags and, in fact, are often free, but the chances of finding a public domain program that does precisely what you want are not very good. You might get lucky and find a small pre-written program that gets you part way there. Either way, the sensible thing to do is to put together some BASIC statements of your own. You don't need four years at the Massachusetts Institute of Technology to write small programs in BASIC, and

this is precisely the reason it was included in the machine.

Lots of people discover, either through curiosity or necessity that BASIC is just great for small-scale stuff. With its fast feedback and ready editor, they soon progress to the point where the machine is producing the results *they* specified, right on the screen in front of them. They even get the thing to put it all on the paper in the printer. Such success, however, will lead inevitably to a big bump in the road: disk operation under program control.

## Forgetful friend

No matter how good your program is, there will come a time to turn off the machine, or a least load another program. When that happens, any data your program may have produced will have been lost. The best you can hope for is a paper copy, but even that will have to be re-entered if you don't want to start again from scratch. Trying to get any long-term work accomplished in such a situation is like working with a forgetful friend — you have to explain everything *every* time he shows up for work.

What you need, of course, is a way to save your information to disk storage for easy recall, and one of the easiest ways to do that is with a sequential file. Technically, a sequential file consists of a directory entry which points to the start of a sequence of disk sectors of indeterminate length, but you can think of it as a list with a name. The length of the list depends on how much stuff you put into it. When you read things back from the list, the computer starts at the top of the list and works its way to the end. What could be simpler?

## Remedy

Well, the instructions on how this is to be done, that's what. If you have the same trouble I had in learning how to use this simple file structure, then you could use a little help. The manuals tell you what it is, what it can do and even how to write one, but they somehow never really show you how to *use* the thing.



As a remedy, I thought it might be helpful if we took an example and worked through it step by step. Let's say you have a program producing the results you want to store between sessions. The first step is to make a list of variable names used to identify the data. Customer's name might be kept under the variable name N\$. Index variables used to control a FOR ... NEXT loop will probably not need to be stored. You will want to list only the variables of the things you need to save.

While you are thinking about the names of the things you are going to save, it would be a good time to pick some sort of variable for the file's name. This could be any name you wish, but in our demo program I picked "CUSTOMER'S LAST NAME" for this dual role. It both gets stored with the other information in the file *and* becomes the name of the file.

### Writing your file

The examples used below refer to the sample program which follows this article. In setting up your variable names, I recommend that you set up arrays with the DIMension statement.

```
10 DIM A(1), B$(1), Z$(2), H$(1), N$(1),
   FIS(1)
```

It simplifies things for groups of data with many elements and sets out the important variables for all to see near the top of your program. BASIC will let you use up to eleven subscripted variables [ (0) through (10) ] without dimensioning them first, but I suggest you create them explicitly with the DIM statement. The computer has to create them the first time they are used anyway. By the way, all of the variables created in this particular statement are not used in the example program. This example program, however, will be elaborated on in future issues, and I thought I would save you the trouble of having to re-type lines.

```
390 F$="0:"+FIS
```

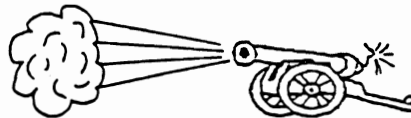
This line prepares the file name variable FI\$ for transmission to the disk drive. It combines the name you have chosen with DOS-speak (Disk Operating System) for "this goes on drive number zero". If you own a dual disk drive (not two single drives), it would be possible to send it to the second disk drive with "1:". The drive names within a particular dual-disk unit are designated "0" and "1". This designation comes before the file name you wish to use and the colon (:) separates the 0 or 1 from the name.

```
400 OPEN 15,8,15,"I0":OPEN1,8,2,F$+"$,S,W"
```

Now that's quite a mouthful, but don't turn the page yet. The OPEN statement, as its name implies, opens a channel of communication between the computer and, in this case, the disk drive. The Com-

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modore 64 and 128 PC allow you to open many channels of communication at once.

The word "file" has come to be used in at least a couple of different ways. A file can be a group of data that belong together (much like the stuff you put in a manilla folder and place in a filing cabinet). Programmers have developed the habit of referring to the means by which such files are moved about as "logical files" or "files" for short. If a file was being delivered to a computer through a wire, when the computer looked down that wire it would, logically enough, see a file.

In the Commodore 64 and 128 PC, you can assign a number to any file (thereby making it possible to refer to it later without confusion). The number chosen for the file in the first OPEN statement is number 15.

Devices such as printers, disk drives, and the like also have numbers. The number of the disk drive is 8. It's as though we had our choice of phone lines (we picked line 15), and dialed the device's number (8). The last number in the OPEN statement is like an extension number. In the first example this extension number (it is called a "secondary address") is 15, which puts us in touch with the disk drive's command center (called a "command channel"). This is the part of the drive to which we will send commands and from which we can get messages about how things are going in the drive (error messages primarily).

Such a command is included in the OPEN statement in quotation marks. The message is "I0" or initialize drive zero which resets the thing and makes sure it is ready for the work ahead.

The second OPEN statement creates the means by which the example program will store our file of information. The number for this logical file is "1", the device it is located in is "8", and the secondary address chosen was "2".

The interesting part of this statement is in the string that follows these numbers. Actually, the string is formed in the statement itself. F\$ is the string variable in which we put our file name and it is combined an S and W. The S tells the disk that this is a Sequential file, and the W simply means that this OPEN statement is preparing a file to be Written.

```
410 PRINT#1, A
420 PRINT#1, B$
430 PRINT#1, Z$
440 PRINT#1, H$
450 PRINT#1, Z$(1)
460 PRINT#1, N$(3)
470 PRINT#1, F$
480 PRINT#1, "END"
```

Here we are writing a series of data string items to our opened file. As you can see, the logical file being used is file number one. The last item in the list is

literally the END. Sequential files can be any length, and this is one way of checking later to see if we have reached the end. The "error channel" (number 15) is not checked in our simple program, but it could have been, and probably should be in a large program.

I should mention in passing that the variables A and B\$ with no subscript have an implied subscript of (0). When you mean the first item (and in computers you usually count from zero, not one) you can use this fact as a short cut.

```
490 CLOSE 1: CLOSE 15
```

Every OPEN should have a corresponding CLOSE statement. This is especially important when using disk files. The drive can't know your finished writing a file until you close the file. When a file is closed, the disk drive proceeds with the necessary housekeeping. Failure to close a file will result in trouble later (the name of an improperly closed file is followed by an asterisk in a display of the disk directory to alert you).

### Reading your file

Getting your data onto the disk is only half the battle. You must also be able to retrieve and use the data in order to have accomplished much of anything at all. File reading is very nearly the reverse of writing.

```
10 DIM A(1), B$(1), Z$(2), H$(1), N$(1),-
   FIS(1)
```

The part of our program that reads our file might have been a part of *another* program. If it had been, you might avoid some grief by re-using the data statement from the program that wrote the file. It is a nice check to insure that you haven't forgotten something important.

```
510 PRINT "FILE NAME";
520 INPUT FIS
530 F$="0:"+FIS
```

These lines input the name of the file we wish to read and prepare it for transmission to the disk drive.

```
540 OPEN 15,8,15,"I0":OPEN 1,8,2,F$+"S,-
R"
```

These lines open and initialize the disk. The S (again) stands for sequential, and the R for read.

```
550 INPUT#1,A
560 INPUT#1,B$
570 INPUT#1,Z$
580 INPUT#1,H$
590 INPUT#1,Z(1)
600 INPUT#1,N$(3)
610 INPUT#1,FIS
620 INPUT#1,ES$
```

These lines read the data back from the disk. The important thing to remember about sequential files is

that they *are* sequential. You read the data in the same order in which they were written. ES\$ is the place for our file "END".

```
630 IF ES$="END" THEN 640
640 CLOSE 1: CLOSE 15
```

When the end of the file is reached, control will pass to line 640. Of course, in our simplified example, there is nowhere else for it to go except 640, but that will change as we gain confidence and get fancy in coming issues.

Well, I hope the short demo program supplied with this article gives you a good start on *your* first file. Feel free to correspond. See you next time.



```
10 dima(1),b$(1),z$(2),h$(1),n$(3),fi$(1),es$(1)
20 print"[clr]":rem easy seq. file 7/14/
85 by'rod diegel
30 print"[grn]"
40 poke53280,0
50 poke53281,0
60 goto150
70 print"[clr][down][down][down][down]"
80 print"[right][right][rvs on][yel]r[rvs off][grn]lead file & reprint on screen[down][down]"
90 print"[right][right][rvs on][yel]m[rvs off][grn]ake new file report[down][down]"
100 print"[right][right][right][right][right][right][right]enter hilite of your choice"
110 geta$:ifa$=""then110
120 if a$="r"then510
130 if a$="m"then150
140 goto110
150 print"[clr][down][down]enter date month/day/year"
160 input h$
170 print"enter customers first name"
180 input n$(3)
190 print"enter customers last name"
200 input fi$
210 print"enter first item purchased"
220 input z$(1)
230 print"enter price"
240 input a$
250 print"enter second item purchased"
260 input z$
270 print"enter price"
280 input b$
290 print"[clr][down][down][down][down]"
300 print"date of purchase " h$
310 print"[down][down]customers name " n$(3) " fi$
320 print"[down][down]items purchased"
330 print"[down][down]first item " z$(1) a$
340 print"second item " z$ val(b$)
350 print"[down][down]total cost "a+val(b$)
```

```
360 print"[down][down][right][right][right][right][right][right][right][right][right][right][right][right][right][right]"
370 geta$:ifa$=""then370
380 if es$="end" then70
390 f$="0:""+fi$
400 open15,8,15,"i0":open1,8,2,f$+"s,w"
410 print#1,a$
420 print#1,b$
430 print#1,z$
440 print#1,h$
450 print#1,z$(1)
460 print#1,n$(3)
470 print#1,fi$
480 print#1,"end"
490 close1:close15
500 goto70
510 print"[down][down]print file name"
520 input fi$
530 f$="0:""+fi$
540 open15,8,15,"i0":open1,8,2,f$+"s,r"
550 input#1,a$
560 input#1,b$
570 input#1,z$
580 input#1,h$
590 input#1,z$(1)
600 input#1,n$(3)
610 input#1,fi$
620 input#1,es$
630 if es$="end"then640
640 close1:close15
650 goto290
```

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# BASIC ALLEY:

## Questions Answered FRE(0)

by Bob Richardson

Summer has arrived, as has the end of another school year. Often, one can come up with many questions when there are no teachers around — especially in the area of computers. Do you have a burning question, or a curiosity in the back of your mind? Send it in! I will be more than happy to answer it! It will be a welcome relief from all the mail marked: "Urgent! Open *now*! You may already have won a Commodore Plus/4 computer!" Moving right along, here's this month's first question:

**Q:** The PEEK statement is usually described as the reverse of POKE. I understand that POKE puts things in memory and PEEK gets things out, but I am unclear as to what you can do with the things you get out (and *how* you do it). Could you explain how PEEK works and of what use it is?

**A:** First, for those uninitiated with POKE, a bit of schooling . . . POKE is a command that allows you to place a number directly into the computer's memory. In a computer, memory consists of what are called bytes. Think of these bytes as tiny boxes that can hold a number. These boxes are not very large, so they can only hold a number between 0 and 255. This may not sound like a lot of numbers for such an expensive computer, but the Commodore 64 has over 65,000 of these boxes.

Each memory location (or box, if you prefer) has its own ADDRESS. The first box in the computer has an address of 0 (zero), the next box has an address of 1, and so on, up to the last box which has 65535 as its address. These numbers allow you to directly access each memory location individually.

Memory locations (also referred to as BYTES) serve several unique purposes. Some are used simply to store numbers; others store your own programs and variables. While others control the 64's special sound and video capabilities. To access these BYTES, there are two special commands in BASIC called PEEK and POKE.

The POKE command allows you to place a number directly into a byte. This can be used to control many different functions such as the 64's keyboard, the SID (Sound Interface Device), and VIC II (Video Interface Controller).

For example, if you wanted to change the background color of your screen to black and the border to dark grey, type in the following command:

POKE 53280,0: POKE 53281,11

What these commands accomplish is deceptively simple: 53280 is the memory location that contains the current background color. 53281 is the location for the border. POKEing the number zero into 53280 makes the background black, and the 11 in 53281 turns the border dark grey. Briefly, here are all the colors and their corresponding numbers that you can POKE into 53280 and 53281 . . .

COLOR	POKE	COLOR	POKE
Black	0	Orange	8
White	1	Brown	9
Red	2	Lt. Red	10
Cyan	3	Dk. Grey	11
Purple	4	Med. Grey	12
Green	5	Lt. Green	13
Blue	6	Lt. Blue	14
Yellow	7	Lt. Grey	15

Now, in answer to The Big Question, "How, exactly, is PEEK used?" Suppose you wanted to tell if the SHIFT key is being pressed. The memory location for the shift key is 653; and the Programmer's Reference Guide says that if memory location 653 contains a value of **one**, then the SHIFT key is currently depressed. (Physically, not psychologically!) Your program might look like this:

```
10 X=PEEK(653)
20 IF X=0 THEN PRINT"SHIFT NOT DEPRESSED"
30 IF X=1 THEN PRINT"SHIFT IS IN A DEPRESSED MOOD"
40 GOTO 10
```

Getting back to a more serious state of mind, Line 10 assigns the value stored in memory location 653 to the variable X. Line 20 checks to see if the SHIFT key is not being held down. If this is the case, a suitable message is displayed. Line 30 will inform you if you are pressing down on the SHIFT key. Finally, Line 40 starts the whole process over again.

Location 653 can also tell you if the Commodore Logo key is depressed (value of 2), or if the CTRL key is down (value of 4).

Another handy location you can toy around with is 197. This is the value of the current key being held down. This is not CHR\$ value, but the actual number that the 64 uses when decoding keypresses as it scans the board. Try this program:

```
10 PRINT PEEK(197)
20 GOTO 10
```

Line 10 will display the value of memory location 197 — try pressing a few keys and watch what happens to the number. You can use these keyboard values in programs instead of the GET statement so that you receive constant input. This is suitable for games where it is necessary to see if a button is still held down on the keyboard.

Remember: Many POKES (especially in memory locations 0 through 1023) can cause your 64 to crash, but turning the computer off and back on will eliminate any problems. Nothing you can type on the keyboard will damage your computer unless you're an elephant!

**Q:** On the Amiga, how do I execute a program without losing the control of my CLI window?

**A:** AmigaDOS has a command that automatically starts a new CLI task and executes a program in that task instead of your current window. The format for this command is:

```
RUN programname
```

For example:

```
RUN DF1:APPLICATIONS/SPREADSHEET
```

This command will execute the program SPREADSHEET in the APPLICATIONS directory on the disk in Drive 1. You can also use this command in conjunction with other DOS commands. For example, if you wanted to send the file REPORT.DOC to the printer without losing your CLI window, you could type:

```
RUN TYPE REPORT.DOC TO PRT:
```

When the printout is finished, the new CLI task will automatically close down, freeing any memory it may have borrowed. One final note: The new CLI task will *not* have its own window, so you will not see it operating.

By now, I'm sure you'd like to be getting back to your summer, so I close with an ancient grade-school proverb:

No more keyboards,  
No more disks,  
No more CRT's  
Dirty looks!

# Potpourri

## Quickies, Short Takes & Nutshell Reviews

### Promenade

For about \$100 you can get an E-PROM programmer that will allow you to "burn" chips for your computer. I got one. I love it! I have programmed a new KERNAL chip, so that now when I power up my C-64 I get light and dark gray colors, with black print. The top of my screen no longer says "Commodore BASIC"; it now says "Property of John Olsen".

As long as I was changing the KERNAL, I removed all the tape routines and replaced them with a DOS wedge. The device now defaults to 8 (not 1), so I can load or save programs without the closing quote, comma, and eight. It took less than a minute to burn the chip with **Promenade**. Then it was a simple matter of opening the keyboard, removing the KERNAL

chip and replacing it with the one I made.

**Promenade** from Jason-Ranheim in San Jose, is a quality piece of hardware that makes all this possible. And you can do even more! You can make your own cartridges! Buy the chips, the PC board, and a plastic case. Then put just about any program you want on the chip. Imagine having your favorite word processor on cartridge, available immediately with no loading time! I now have my word processor, terminal program, M/L monitor, adventure programmer, and disk doctor all on a cartridge. Fantastic!

The only bad thing is the manual that comes with **Promenade**. I found it so confusing that I didn't even plug my **Promenade** in for two months. It was only when I got a book from CSM

software that I understood how to program chips. See my separate review for the book. But the hardware is tops! Recommended!

John Olsen

### EPROM Programmers Handbook

If you have an EPROM burner (like the superb **Promenade**) you must get the EPROM Programmers Handbook from CSM Software, Inc. It costs \$32.95 and includes a disk containing programs from the book, to save you typing time. This is the book that takes the mystery out of burning chips. I was so confused with my EPROM programmer that I didn't use it for two months after buying it. Then I got this



great book. It explains things in terms that I can understand.

The same night that I got the book, I finally plugged in my EPROM programmer and started burning chips! The book not only explains the theory, but tells you exactly how to put it into practice. Many sample programs are included so you can make auto-start cartridges, and modify your KERNAL chip. It tells you how to modify DOS, how to make C-64 or special C-128 cartridges, disable the disk drive "bump", and much more. Thanks to this book, I started using my **Promenade**. Too bad this book isn't included in the **Promenade** package. It should be!

John Olsen

### GBA Championship Basketball

Gamestar, \$34.95

This is without a doubt the best arcade basketball game I've seen. If you liked **One on One**, you'll love this. It's two-on-two with some interesting options, including one player against the

computer, two players playing against each other, and even two players playing as a team against the computer. Create your own unique player, pair him with a teammate modeled after a famous NBA player, and then enter your team into the four division, twenty-three team league and see if you can work your way to the top.

As usual, Gamestar offers a multitude of features, all selected from the joystick. Shots available include hook shots, tip-ins, jump shots, dunks, three pointers, and, of course, free throws. The practice mode even gives you the option of playing "Horse". **Championship Basketball** is another winner in Gamestar's on-going string of exceptionally playable games.

Randy Chase

### The Heechee Saga

Most computer users I know like to read. Of course, reading skill is almost a prerequisite to be-

ing able to use a computer effectively, but that's not what I mean. I'm talking about reading for pleasure.

I'm a voracious reader myself, which is really a prerequisite to being a good writer. I belong to more book clubs than most people even know exist, and if I stopped buying books tomorrow, I could probably buy an Amiga for every room in the house within a year. I read one or two books a week, and have done so for years now.

For me to remember a particular book among the many, to have that story stay with me, stay fresh in my mind, it *has* to be very special. You know what I mean — *Catcher In The Rye*, *Nineteen Eighty-Four*, *Fahrenheit 451* — special.

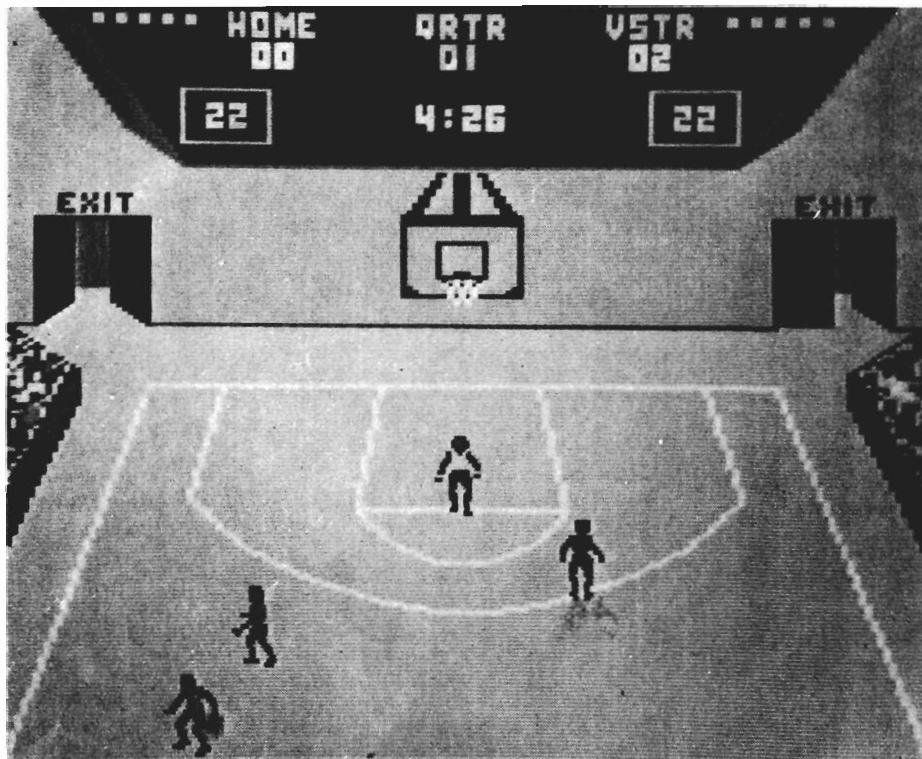
Well, I'm here to tell you that **The Heechee Saga** by the formidable Frederik Pohl is such a story. The story spans three separate novels: *Gateway*, *Beyond The Blue Event Horizon*, and *Heechee Rendezvous*. This is science fiction at it's apex, a towering monument to imagination, talent and craft.

Why am I talking about this here? Because there's something about these books I think you'll find particularly interesting — some of the major characters in the series aren't people. They're software.

No, I'm not even going to begin to try and explain it any more than that to you. Believe me, it would be doing you a disservice. But if you want to see computers and software as they will be in fifteen or twenty five years, if you want a remarkable glimpse of tomorrow, go to the bookstore and pick up all three volumes. They're all available in paperback, all for under \$4.00 each.

And in a world where most video games sell for \$30.00, that's a heck of a bargain.

Michael Daigle



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91 West 9th #203  
Clovis, CA 93612  
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Cobb, CA 95426  
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Culver City, CA 90230  
PUG of Silicon Valley  
22355 Rancho Ventura Road  
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Denair, CA 95316  
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User's Group  
8315 Firestone Blvd.  
Downey, CA 90241  
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7615 Leviston Avenue  
El Cerrito, CA 94530  
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Humboldt Commodore Users  
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Eureka, CA 95501  
Fairfield VIC-20 Club  
1336 McKinley Street  
Fairfield, CA 94533  
(707) 427-0143  
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P.O. Box 16098  
Fresno, CA 93755  
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Club  
10530 Sky Circle  
Grass Valley, CA 95945  
Diamond Bar Rop User's Club  
2644 Amelgado  
Hacienda Heights, CA 91745  
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Commodore 64 Club  
1804 North Dundee  
Highland, CA 92346  
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P.O. Box 4436  
Lancaster, CA 93539  
(805) 942-2626  
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886 South K  
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P.O. Box 9189  
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Lincoln Computer Club  
750 Yosemite  
Manteca, CA 95336

Napa Valley Commodore  
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2680 Jefferson Street  
Napa, CA 94558  
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Pasadena, CA 91106  
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Pasadena, CA 91107  
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877 Grant Avenue  
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762 Ruth Drive  
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Riverside, CA 92509  
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Commodore Club  
P.O. Box 800  
Rosemead, CA 91770  
Sacramento Commodore  
Computer Club  
P.O. Box 2227  
Sacramento, CA 95810  
Computer Barn Computer  
Club  
319 Main Street, Suite 2  
Salinas, CA 93901  
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San Diego, CA 92138-6531  
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3562 Union Street  
San Diego, CA 92103  
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6353 Lake Apopka Place  
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S.F. Commodore Users Group  
278 27th Avenue #103  
San Francisco, CA 94121

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1503 A Dolores  
San Francisco, CA 94110  
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525 Crestlake Drive  
San Francisco, CA 94132  
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P.O. Box 18473  
San Jose, CA 95158  
Logiks Commodore Computer  
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620 Del Ganado Road  
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So. Bay Commodore 64  
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P.O. Box 8068  
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4237 Plumeria Court  
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2791 McBride Lane — #121  
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14660 La Paz Drive  
Victorville, CA 92392  
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Walnut Creek, CA 94596

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64 Educators User's Group  
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6215  
Panama City, FL 32401

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The Commodore Advantage  
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Pensacola, FL 32523  
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Commodore User's Group  
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Shalimar, FL 32579  
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Commodore Computer Club  
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St. Petersburg, FL 33742

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Tallahassee, FL 32301

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Tamarac, FL 33320

Tampa Bay Commodore  
Computer Club  
10208 North 30th Street  
Tampa, FL 33612

South Florida PET User's  
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7170 S.W. 11th  
West Hollywood, FL 33023  
(305) 987-6982

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110 Academy Street  
Canton, GA 30114

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6618 Foxdale Drive  
Columbus, GA 31907  
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Stone Mountain, GA 30083  
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20/64  
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Kailua, HI 96734

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(208) 344-6302

Commodore — Coeur D'Alene  
Computer Club  
506 Luncford Lane  
Coeur D'Alene, ID 83814  
(208) 765-3803

GHS Computer Club  
Grangeville High School  
910 South D Street  
Grangeville, ID 83530

Eagle Rock Users Group  
900 South Emerson  
Idaho Falls, ID 83401

Commodore User's Group  
310 Emerald Drive  
Kellogg, ID 83837  
(208) 784-8751

Pocatello Commodore Users  
Group  
82 Mountain Drive  
Pocatello, ID 83204

Commodore Users  
548 East Center  
Pocatello, ID 83201

SRHS Computer Club  
Salmon River High School  
Riggins, ID 83549

User's Group of Lower Idaho  
Route 4, Box 67  
Rupert, ID 83350  
(208) 436-4283

Caribou Commodore Club  
P.O. Box 535  
Soda Springs, ID 83276  
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(208) 547-4143

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East Side Computer Club  
3103 Clay Street  
Alton, IL 62002  
(618) 462-7136

Gateway Computer Club  
P.O. Box 207  
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Canton Area Commodore  
User's Group  
c/o Spoon River College  
RR #1  
Canton, IL 61520  
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Commodore 64 User's Club  
104 Susan Lane  
Carterville, IL 62918  
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Commodore  
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(217) 352-9681

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Chicago, IL 60614

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Chicago, IL 60606  
(312) 685-0994

Shelly Wernikoff  
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Herb Gross, Secretary  
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2108 Sherman Avenue  
Evanston, IL 60201

C-64 User's Group  
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Lincolnwood, IL 60466  
(312) 588-0334

Survivors of Sixty-Four  
User's Group  
WESL Institute  
Western Illinois University  
Macomb, IL 61455  
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(309) 837-5378

Mt. Vernon Commodore  
Users  
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Mt. Vernon, IL 62864

Central Illinois PET Users  
635 Maple  
Mt. Zion, IL 62549  
(217) 864-5320

Fox Valley 64 User's Group  
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N. Aurora IL 60542  
(312) 898-2779

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11004 South Cicero Avenue  
Oak Lawn, IL 60453

Commodore User's Club  
1707 East Main Street  
Olney, IL 62450

VIC-20/64 User's Support  
114 South Clark Street  
Pana, IL 62557  
(217) 562-4568

Peoria Area PET User's Group  
800 S.W. Jefferson  
Peoria, IL 61605  
(309) 673-6635  
(309) 674-5998

Illinois Valley Commodore  
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2330 12th Street  
Peru, IL 61354  
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Rockford Area PET Users  
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Springfield PET User Group  
3116 Concord  
Springfield, IL 62704  
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Kankakee Hackers  
RR 1, Box 279  
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Columbus Commodore Club  
2676 Lafayette Avenue  
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Commodore Computer Club  
3814 Terra Terrace  
Evansville, IN 47711  
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Hebron, IN 46341  
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12104 Meadow Lane  
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Seymour Peckers  
c/o D&L Camera Shop  
108 North Chestnut  
Seymour, IN 47274

Northern Indiana Commodore  
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927 S. 26th Street  
South Bend, IN 46615

Commodore 64 User's Group  
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Ames, IA 50010

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Quad Cities Commodore  
Computer Club  
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Davenport, IA 52808  
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Newton Commodore User's  
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Salt City Commodore Club  
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101 South Burch  
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Commodore User's Group  
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Louisville, KY 40222

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Baton Rouge, LA 70821

Commodore PET User Group  
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Gretna, LA 70053  
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917 Gordon Street  
New Orleans, LA 70117  
(504) 948-7643

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Club  
198 India Drive  
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## Maine

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SO. ME 64  
10 Walker Street  
Portland, ME 04102  
(207) 761-1626

Compumania  
81 North Street  
Saco, ME 04072  
(207) 282-7418

Northwoods Commodore  
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Van Buren, ME 04785

Coastal Commodore Club  
Waldoboro Village, Apt. 9  
Waldoboro, ME 04572

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Warren, MI 48093  
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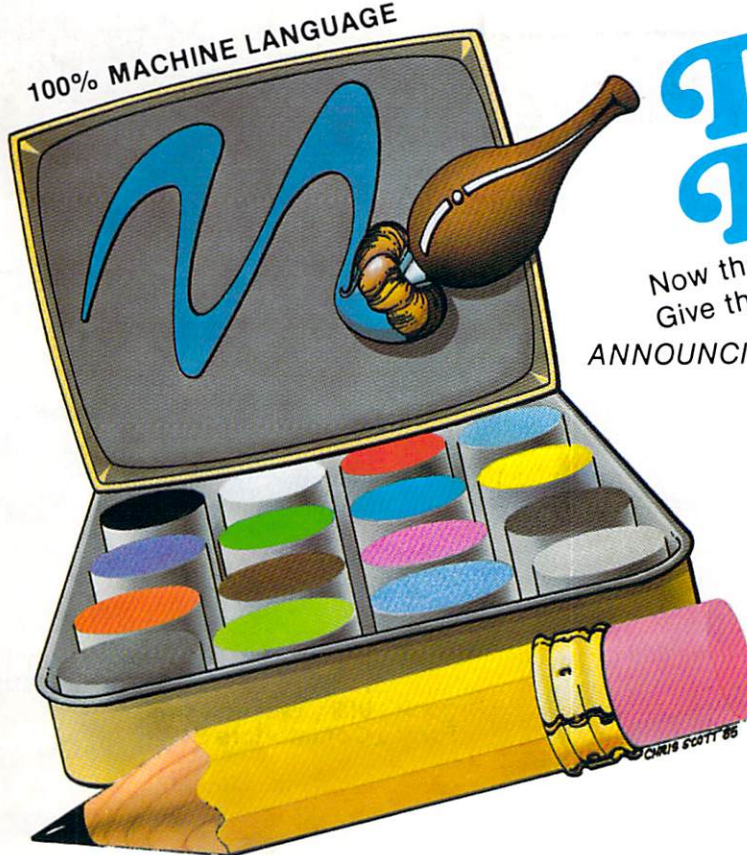
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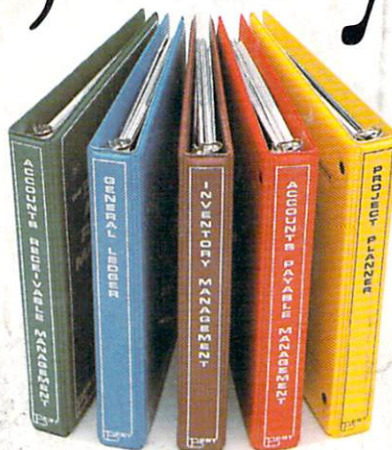


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